OM-243 346C

2011–01

Processes

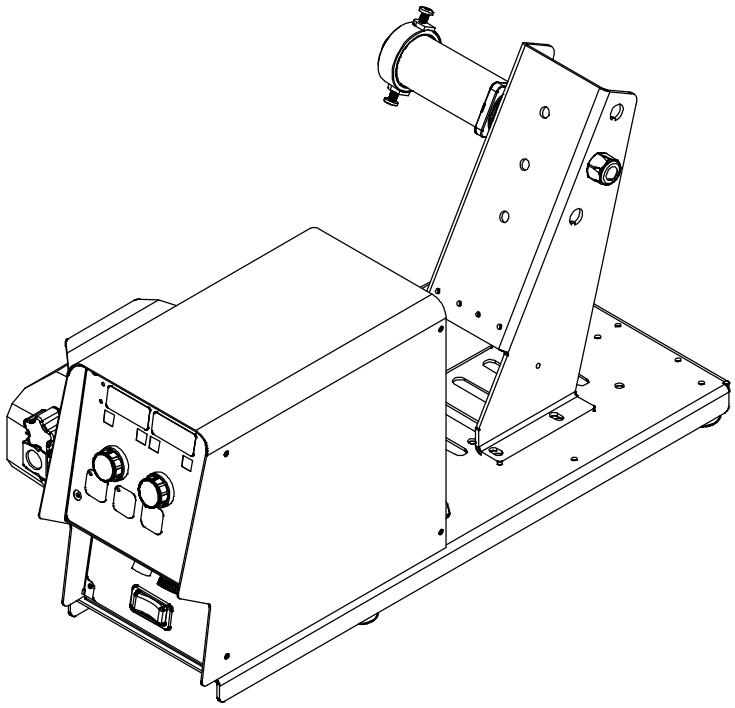
MIG (GMAW) Welding
MIG (GMAW-P) Welding
Flux Cored (FCAW) Welding
(Gas- And Self-Shielded)

Description

CV

Wire Feeder
Aluminum Push/Pull Capable

S-74 MPa Plus
CE



OWNER'S MANUAL

File: MIG (GMAW)

Visit our website at
www.MillerWelds.com

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite.

ISO 9001 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide the exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual specification sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**

TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller®

DECLARATION OF CONFORMITY

for European Community (CE marked) products.

MILLER Electric Mfg. Co., 1635 Spencer Street, Appleton, WI 54914 U.S.A. declares that the product(s) identified in this declaration conform to the essential requirements and provisions of the stated Council Directive(s) and Standard(s).

Product/Apparatus Identification:

Product	Stock Number
S-74 MPA PLUS	300577

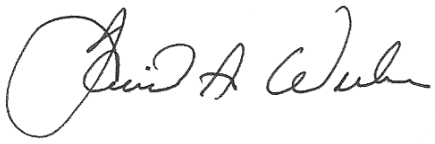
Council Directives:

- 2006/95/EC Low Voltage
- 2004/108/EC Electromagnetic Compatibility

Standards:

- IEC 60974-1:2005 Arc welding equipment – Part 1: Welding power sources
- IEC 60974-5:2007 Arc welding equipment – Part 5: Wire feeders
- IEC 60974-10:2007 Arc Welding Equipment – Part 10: Electromagnetic compatibility (EMC) requirements
- EN 50445:2008 Product family standard to demonstrate compliance of equipment for resistance welding, arc welding and allied processes with the basic restrictions related to human exposure to electromagnetic fields (0 Hz – 300Hz)

Signatory:



December 21, 2010

David A. Werba

MANAGER, PRODUCT DESIGN COMPLIANCE

Date of Declaration

250868A

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SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

Protect yourself and others from injury — read and follow these precautions.

1-1. Symbol Usage

DANGER! – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

NOTICE *– Indicates statements not related to personal injury.*

☞ *Indicates special instructions.*

This group of symbols means Warning! Watch Out! ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-5. Read and follow all Safety Standards.

Only qualified persons should install, operate, maintain, and repair this unit.

During operation, keep everybody, especially children, away.

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists in inverter welding power sources AFTER removal of input power.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

HOT PARTS can burn.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

ARC RAYS can burn eyes and skin.

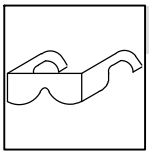
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes from arc rays and sparks when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton, or wool) and foot protection.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Use only correct fuses or circuit breakers. Do not oversize or by-pass them.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.



FLYING METAL or DIRT can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

ELECTRIC AND MAGNETIC FIELDS (EMF) can affect Implanted Medical Devices.

- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

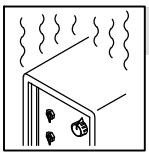
1-3. Additional Symbols For Installation, Operation, And Maintenance

FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

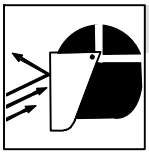
FALLING EQUIPMENT can injure.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.
- Keep equipment (cables and cords) away from moving vehicles when working from an aerial location.
- Follow the guidelines in the Applications Manual for the Revised NIOSH Lifting Equation (Publication No. 94–110) when manually lifting heavy parts or equipment.



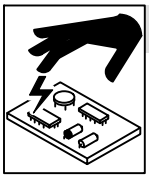
OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



FLYING SPARKS can injure.

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.



STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

MOVING PARTS can injure.

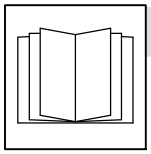
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

WELDING WIRE can injure.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

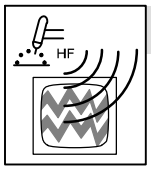
MOVING PARTS can injure.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance and troubleshooting as necessary.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before reconnecting input power.



READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform maintenance and service according to the Owner's Manuals, industry standards, and national, state, and local codes.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-4. California Proposition 65 Warnings

Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. *Wash hands after handling.*

This product contains chemicals, including lead, known to the state of California to cause cancer, birth defects, or other reproductive harm. *Wash hands after use.*

For Gasoline Engines:

Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

For Diesel Engines:

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

1-5. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org and www. sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151 (phone: 703-788-2700, website:www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (phone: 800-463-6727, website: www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org.

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (phone: 1-866-512-1800) (there are 10 OSHA Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: www.osha.gov).

U.S. Consumer Product Safety Commission (CPSC), 4330 East West Highway, Bethesda, MD 20814 (phone: 301-504-7923, website: www.cpsc.gov).

Applications Manual for the Revised NIOSH Lifting Equation, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (phone: 1-800-232-4636, website: www.cdc.gov/NIOSH).

1-6. EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). Welding current creates an EMF field around the welding circuit and welding equipment. EMF fields may interfere with some medical implants, e.g. pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, access restrictions for passers–by or individual risk assessment for welders. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Do not place your body between welding cables. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to workpiece as close to the weld as possible.
6. Do not work next to, sit or lean on the welding power source.
7. Do not weld whilst carrying the welding power source or wire feeder.

About Implanted Medical Devices:

Implanted Medical Device wearers should consult their doctor and the device manufacturer before performing or going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations. If cleared by your doctor, then following the above procedures is recommended.

SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

Se protéger et protéger les autres contre le risque de blessure — lire et respecter ces consignes.

2-1. Symboles utilisés

DANGER! – Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

***NOTE** – Indique des déclarations pas en relation avec des blessures personnelles.*

☞ *Indique des instructions spécifiques.*

Ce groupe de symboles veut dire Avertissement! Attention! DANGER DE CHOC ELECTRIQUE, PIECES EN MOUVEMENT, et PIECES CHAUDES. Consulter les symboles et les instructions ci-dessous y afférant pour les actions nécessaires afin d'éviter le danger.

2-2. Dangers relatifs au soudage à l'arc

Les symboles représentés ci-dessous sont utilisés dans ce manuel pour attirer l'attention et identifier les dangers possibles. En présence de l'un de ces symboles, prendre garde et suivre les instructions afférentes pour éviter tout risque. Les instructions en matière de sécurité indiquées ci-dessous ne constituent qu'un sommaire des instructions de sécurité plus complètes fournies dans les normes de sécurité énumérées dans la Section 2-5. Lire et observer toutes les normes de sécurité.

Seul un personnel qualifié est autorisé à installer, faire fonctionner, entretenir et réparer cet appareil.

Pendant le fonctionnement, maintenir à distance toutes les personnes, notamment les enfants de l'appareil.

UNE DÉCHARGE ÉLECTRIQUE peut entraîner la mort.

Le contact d'organes électriques sous tension peut provoquer des accidents mortels ou des brûlures graves. Le circuit de l'électrode et de la pièce est sous tension lorsque le courant est délivré à la sortie. Le circuit d'alimentation et les circuits internes de la machine sont également sous tension lorsque l'alimentation est sur Marche. Dans le mode de soudage avec du fil, le fil, le dérouleur, le bloc de commande du rouleau et toutes les parties métalliques en contact avec le fil sont sous tension électrique. Un équipement installé ou mis à la terre de manière incorrecte ou impropre constitue un danger.

- Ne pas toucher aux pièces électriques sous tension.
- Porter des gants isolants et des vêtements de protection secs et sans trous.
- S'isoler de la pièce à couper et du sol en utilisant des housses ou des tapis assez grands afin d'éviter tout contact physique avec la pièce à couper ou le sol.
- Ne pas se servir de source électrique à courant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique à courant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique à courant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- D'autres consignes de sécurité sont nécessaires dans les conditions suivantes : risques électriques dans un environnement humide ou si l'on porte des vêtements mouillés ; sur des structures métalliques telles que sols, grilles ou échafaudages ; en position coincée comme assise, à genoux ou couchée ; ou s'il y a un risque élevé de contact inévitable ou accidentel avec la pièce à souder ou le sol. Dans ces conditions, utiliser les équipements suivants, dans l'ordre indiqué : 1) un poste à souder DC à tension constante (à fil), 2) un poste à souder DC manuel (électrode) ou 3) un poste à souder AC à tension à vide réduite. Dans la plupart des situations, l'utilisation d'un poste à souder DC à fil à tension constante est recommandée. En outre, ne pas travailler seul !
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer le poste correctement et le mettre à la terre convenablement selon les consignes du manuel de l'opérateur et les normes nationales, provinciales et locales.
- Toujours vérifier la terre du cordon d'alimentation. Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée, fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Les câbles doivent être exempts d'humidité, d'huile et de graisse; protégez–les contre les étincelles et les pièces métalliques chaudes.
- Vérifier fréquemment le cordon d'alimentation afin de s'assurer qu'il n'est pas altéré ou à nu, le remplacer immédiatement s'il l'est. Un fil à nu peut entraîner la mort.
- L'équipement doit être hors tension lorsqu'il n'est pas utilisé.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- Ne pas toucher des porte électrodes connectés à deux machines en même temps à cause de la présence d'une tension à vide doublée.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité si l'on doit travailler au-dessus du sol.
- S'assurer que tous les panneaux et couvercles sont correctement en place.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.
- Ne pas raccorder plus d'une électrode ou plus d'un câble de masse à une même borne de sortie de soudage.

Il reste une TENSION DC NON NÉGLIGEABLE dans les sources de soudage onduleur UNE FOIS l'alimentation coupée.

- Arrêter les convertisseurs, débrancher le courant électrique et décharger les condensateurs d'alimentation selon les instructions indiquées dans la partie Entretien avant de toucher les pièces.

LES PIÈCES CHAUDES peuvent provoquer des brûlures.

- Ne pas toucher à mains nues les parties chaudes.
- Prévoir une période de refroidissement avant de travailler à l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.

LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'intérieur, ventiler la zone et/ou utiliser une ventilation forcée au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est médiocre, porter un respirateur anti-vapeurs approuvé.
- Lire et comprendre les spécifications de sécurité des matériaux (MSDS) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

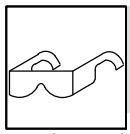
Le rayonnement de l'arc du procédé de soudag génère des rayons visibles et invisibles intense (ultraviolets et infrarouges) susceptibles de provoquer des brûlure dans les yeux et sur la peau. Des étincelles sont projetées pendant l soudage.

- Porter un casque de soudage approuvé muni de verres filtrants approprié pour protéger visage et yeux pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des lunettes de sécurité avec écrans latéraux même sous votre casque.
- Avoir recours à des écrans protecteurs ou à des rideaux pour protéger les autres contre les rayonnements les éblouissements et les étincelles ; prévenir toute personne sur les lieux de ne pas regarder l'arc.
- Porter des vêtements confectionnés avec des matières résistantes et ignifuges (cuir, coton lourd ou laine) et des bottes de protection.

LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Ne soudez pas si l'air ambiant est chargé de particules, gaz, ou vapeurs inflammables (vapeur d'essence, par exemple).
- Brancher le câble de masse sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution, d'étincelles et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.
- Une fois le travail achevé, assurez–vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe–circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Une fois le travail achevé, assurez–vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe–circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Suivre les recommandations dans OSHA 1910.252(a)(2)(iv) et NFPA 51B pour les travaux à chaud et avoir de la surveillance et un extincteur à proximité.



DES PIECES DE METAL ou DES SALETES peuvent provoquer des blessures dans les yeux.

- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non-utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

Les CHAMPS ÉLECTROMAGNÉTIQUES (CEM) peuvent affecter les implants médicaux.

- Les porteurs de stimulateurs cardiaques et autres implants médicaux doivent rester à distance.
- Les porteurs d'implants médicaux doivent consulter leur médecin et le fabricant du dispositif avant de s'approcher de la zone où se déroule du soudage à l'arc, du soudage par points, du gougeage, de la découpe plasma ou une opération de chauffage par induction.

LE BRUIT peut endommager l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvées pour les oreilles si le niveau sonore est trop élevé.

LES BOUTEILLES peuvent exploser si elles sont endommagées.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, des dommages physiques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique ; les maintenir ainsi que les éléments associés en bon état.
- Détourner votre visage du détendeur-régulateur lorsque vous ouvrez la soupape de la bouteille.
- Le couvercle du détendeur doit toujours être en place, sauf lorsque la bouteille est utilisée ou qu'elle est reliée pour usage ultérieur.
- Utiliser les équipements corrects, les bonnes procédures et suffisamment de personnes pour soulever et déplacer les bouteilles.
- Lire et suivre les instructions sur les bouteilles de gaz comprimé, l'équipement connexe et le dépliant P-1 de la CGA (Compressed Gas Association) mentionné dans les principales normes de sécurité.

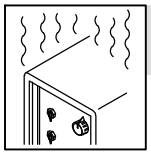
2-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Ne pas installer l'appareil à proximité de produits inflammables.
- Ne pas surcharger l'installation électrique – s'assurer que l'alimentation est correctement dimensionnée et protégée avant de mettre l'appareil en service.

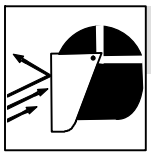
LA CHUTE DE L'ÉQUIPEMENT peut provoquer des blessures.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariots, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un équipement de levage de capacité suffisante pour lever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.
- Tenir l'équipement (câbles et cordons) à distance des véhicules mobiles lors de toute opération en hauteur.
- Suivre les consignes du Manuel des applications pour l'équation de levage NIOSH révisée (Publication Nº94–110) lors du levage manuelle de pièces ou équipements lourds.



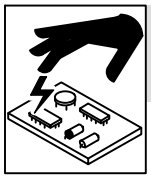
L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement ; respecter le cycle opératoire nominal.
- Réduire le courant ou le facteur de marche avant de poursuivre le soudage.
- Ne pas obstruer les passages d'air du poste.



LES ÉTINCELLES PROJETÉES peuvent provoquer des blessures.

- Porter un écran facial pour protéger le visage et les yeux.
- Affûter l'électrode au tungstène uniquement à la meuleuse dotée de protecteurs. Cette manœuvre est à exécuter dans un endroit sûr lorsque l'on porte l'équipement homologué de protection du visage, des mains et du corps.
- Les étincelles risquent de causer un incendie – éloigner toute substance inflammable.



LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

Les PIÈCES MOBILES peuvent causer des blessures.

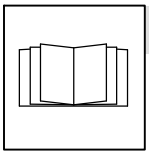
- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.

LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gâchette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.

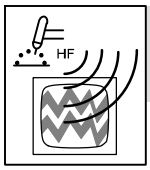
Les PIÈCES MOBILES peuvent causer des blessures.

- S'abstenir de toucher des organes mobiles tels que des ventilateurs.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Lorsque cela est nécessaire pour des travaux d'entretien et de dépannage, faire retirer les portes, panneaux, recouvrements ou dispositifs de protection uniquement par du personnel qualifié.
- Remettre les portes, panneaux, recouvrements ou dispositifs de protection quand l'entretien est terminé et avant de rebrancher l'alimentation électrique.



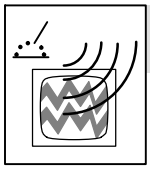
LIRE LES INSTRUCTIONS.

- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que les pièces de rechange recommandées par le constructeur.
- Effectuer l'entretien en respectant les manuels d'utilisation, les normes industrielles et les codes nationaux, d'état et locaux.



LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute fréquence (H.F.) peut provoquer des interférences avec les équipements de radio–navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et un blindage pour réduire les interférences éventuelles.



LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

2-4. Proposition californienne 65 Avertissements

⚠ Les équipements de soudage et de coupage produisent des fumées et des gaz qui contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des malformations congénitales et, dans certains cas, des cancers. (Code de santé et de sécurité de Californie, chapitre 25249.5 et suivants)

⚠ Les batteries, les bornes et autres accessoires contiennent du plomb et des composés à base de plomb, produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation. Se laver les mains après manipulation.

⚠ Ce produit contient des produits chimiques, notamment du plomb, dont l'État de Californie reconnaît qu'ils provoquent des cancers, des malformations congénitales ou d'autres problèmes de procréation. *Se laver les mains après utilisation.*

Pour les moteurs à essence :

⚠ Les gaz d'échappement des moteurs contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation.

Pour les moteurs diesel :

⚠ Les gaz d'échappement des moteurs diesel et certains de leurs composants sont reconnus par l'État de Californie comme provoquant des cancers et des malformations congénitales ou autres problèmes de procréation.

2-5. Principales normes de sécurité

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, de Global Engineering Documents (téléphone : 1-877-413-5184, site Internet : www.global.ihs.com).

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1, de Global Engineering Documents (téléphone : 1-877-413-5184, site internet : www.global.ihs.com).

National Electrical Code, NFPA Standard 70, de National Fire Protection Association, Quincy, MA 02269 (téléphone : 800-344-3555, site Internet : www.nfpa.org et www.sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151 (téléphone : 703-788-2700, site Internet : www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2, de Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (téléphone : 800-463-6727, site internet : www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, de American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (téléphone : 212-642-4900, site Internet : www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, de National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (téléphone : 617-770-3000, site Internet : www.nfpa.org).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, de U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (téléphone : 1-866-512-1800) (il y a 10 bureaux régionaux–le téléphone de la région 5, Chicago, est 312-353-2220, site Internet : www.osha.gov).

U.S. Consumer Product Safety Commission (CPSC), 4330 East West Highway, Bethesda, MD 20814 (téléphone : 301-504-7923, site internet : www.cpsc.gov).

Applications Manual for the Revised NIOSH Lifting Equation, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (télé[hone : 1-800-232-4636, site internet: www.cdc.gov/NIOSH).

2-6. Informations relatives aux CEM

Le courant électrique qui traverse tout conducteur génère des champs électromagnétiques (CEM) à certains endroits. Le courant de soudage crée un CEM autour du circuit et du matériel de soudage. Les CEM peuvent créer des interférences avec certains implants médicaux comme des stimulateurs cardiaques. Des mesures de protection pour les porteurs d'implants médicaux doivent être prises: par exemple, des restrictions d'accès pour les passants ou une évaluation individuelle des risques pour les soudeurs. Tous les soudeurs doivent appliquer les procédures suivantes pour minimiser l'exposition aux CEM provenant du circuit de soudage:

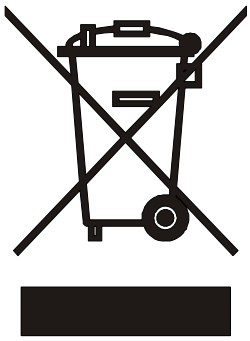
1. Rassembler les câbles en les torsadant ou en les attachant avec du ruban adhésif ou avec une housse.
2. Ne pas se tenir au milieu des câbles de soudage. Disposer les câbles d'un côté et à distance de l'opérateur.
3. Ne pas courber et ne pas entourer les câbles autour de votre corps.
4. Maintenir la tête et le torse aussi loin que possible du matériel du circuit de soudage.
5. Connecter la pince sur la pièce aussi près que possible de la soudure.
6. Ne pas travailler à proximité d'une source de soudage, ni s'asseoir ou se pencher dessus.
7. Ne pas souder tout en portant la source de soudage ou le dévidoir.

En ce qui concerne les implants médicaux :

Les porteurs d'implants doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de soudage par points, de gougeage, du coupage plasma ou de chauffage par induction. Si le médecin approuve, il est recommandé de suivre les procédures précédentes.

SECTION 3 – DEFINITIONS

3-1. WEEE Label (For Products Sold Within The EU)



Do not discard product (where applicable) with general waste.

Reuse or recycle Waste Electrical and Electronic Equipment (WEEE) by disposing at a designated collection facility.

Contact your local recycling office or your local distributor for further information.

3-2. Symbols And Definitions

☞ *Some symbols are found only on CE products.*

A	Amperes	V	Volts	∿	Alternating Current	X	Duty Cycle
IP	Degree Of Protection	Hz	Hertz		Program		Wire Feed
	Jog		Output		Trigger		Line Connection
	Set Up		Sequence		Trigger Hold On		Trigger Hold Off
	Purge		Press To Set		Start		Crater
t	Time	t_1	Preflow Time	t_2	Postflow Time		Read Instructions
	Increase	I_1	Primary Current	I_2	Rated Current	U_2	Load Voltage
U_1	Primary Voltage	A B	Dual Schedule				

SECTION 4 – INSTALLATION

4-1. Important Information Regarding CE Products (Sold Within The EU)

A. Information On Electromagnetic Fields (EMF)

⚠ This equipment shall not be used by the general public as the EMF limits for the general public might be exceeded during welding.

This equipment is built in accordance with EN 60974–1 and is intended to be used only in an occupational environment (where the general public access is prohibited or regulated in such a way as to be similar to occupational use) by an expert or an instructed person.

Wire feeders and ancillary equipment (such as torches, liquid cooling systems and arc striking and stabilizing devices) as part of the welding circuit may not be a major contributor to the EMF. See the Owner's Manuals for all components of the welding circuit for additional EMF exposure information.

- The EMF assessment on this equipment was conducted at 0.5 meter.
- At a distance of 1 meter the EMF exposure values were less than 20% of the permissible values.

ce-emf 1 2010-10

B. Information On Electromagnetic Compatibility (EMC)

⚠ This Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low–voltage supply system. There may be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radiated disturbances.

ce-emc 3 2010-10

4-2. Serial Number And Rating Label Location

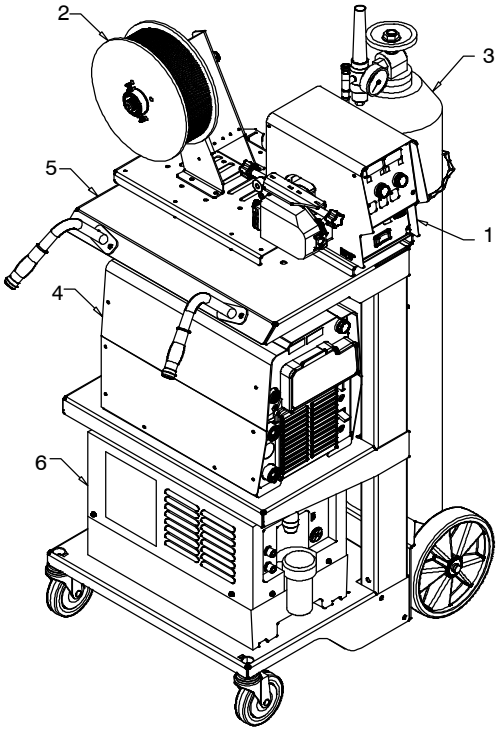
The serial number and rating information for this product is located on the rear panel. Use rating label to determine input power requirements and/or rated output. For future reference, write serial number in space provided on back cover of this manual.

4-3. Specifications

Type of Input Power	Welding Power Source Type	Wire Feed Speed*	Wire Diameter Range	Welding Circuit Rating	IP Rating	Overall Dimensions	Weight
24 Volts AC Single-Phase 10 Amperes 50/60 Hertz	Constant Voltage (CV) DC With 14-Pin And Contactor Control	Standard: 50 To 780 ipm (1.3 To 19.8 mpm) Optional High Speed: 92 to 1435 ipm (2.3 to 36.4 mpm)	.035 To 5/64 in. (0.9 To 2 mm) Max Spool Capacity: 18 in. (457 mm) Max Spool Weight: 60 lb (27 kg)	100 Volts, 750 Amperes, 100% Duty Cycle	IP 21S	Length: 27 in. (686 mm) Width: 12-1/2 in. (318 mm) Height: 14 in. (356 mm)	45 lb (20.4 kg)

* See Section 4-8 for detailed information on wire type, wire size, and wire feed speed.

4-4. Site Selection



⚠ **Do not put feeder where welding wire hits cylinder.**

⚠ **Do not move or operate equipment when it could tip.**

1 Wire Feeder

2 Wire Spool/Reels

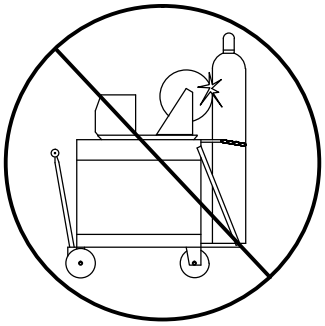
3 Gas Cylinder w/Hose And Regulator (Customer Supplied)

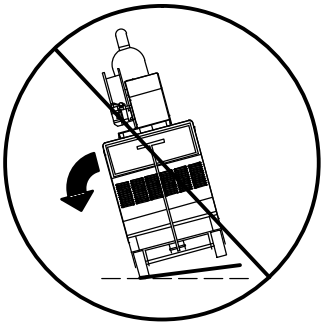
☞ *Shielding gas pressure not to exceed 100 psi (689 kPa).*

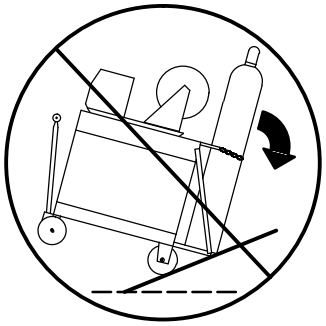
4 Welding Power Source

5 Running Gear

6 Water Cooling System

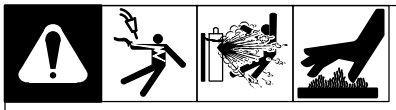






Ref. 803 048 / 246 044-A

4-5. Equipment Connection Diagrams



1 Welding Power Source

☞ *Select welding power source according to Section 5-10.*

2 Contactor Control/Power Cord

3 Positive (+) Weld Cable

4 Negative (–) Weld Cable

5 Workpiece

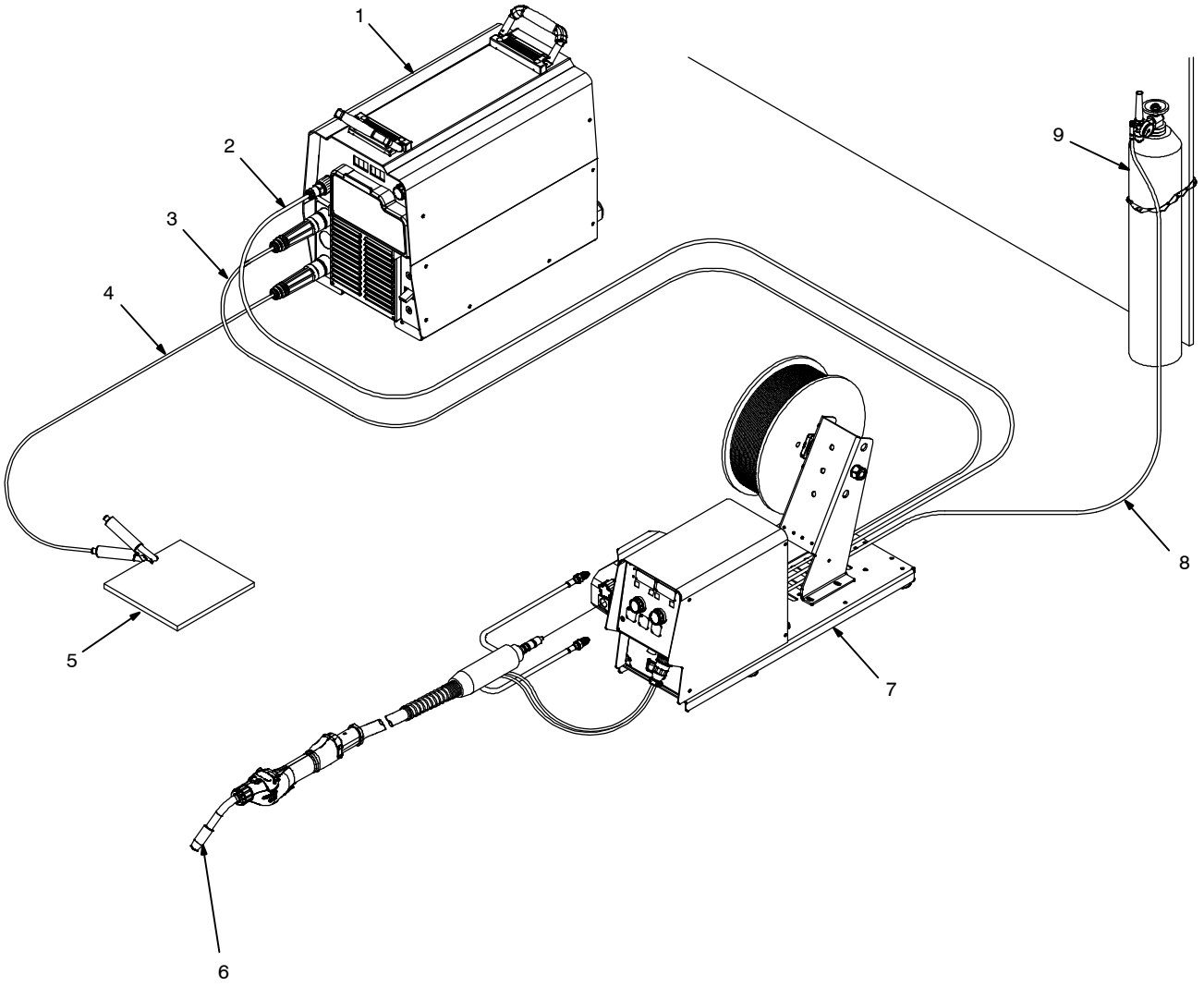
6 Welding Gun

7 Wire Feeder

8 Gas Hose

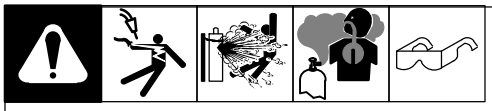
9 Gas Cylinder and Regulator (Customer Supplied)

☞ *Shielding gas pressure not to exceed 100 psi (689 kPa).*



246 040-A

4-6. Rear Panel Connections And Rotating Drive Assembly



1 14-Pin Control Cable - 15 Ft (4.6 m)

2 Shielding Gas Valve Fittings

Requires fitting with 5/8-18 right-hand threads. Connect customer-supplied gas hose.

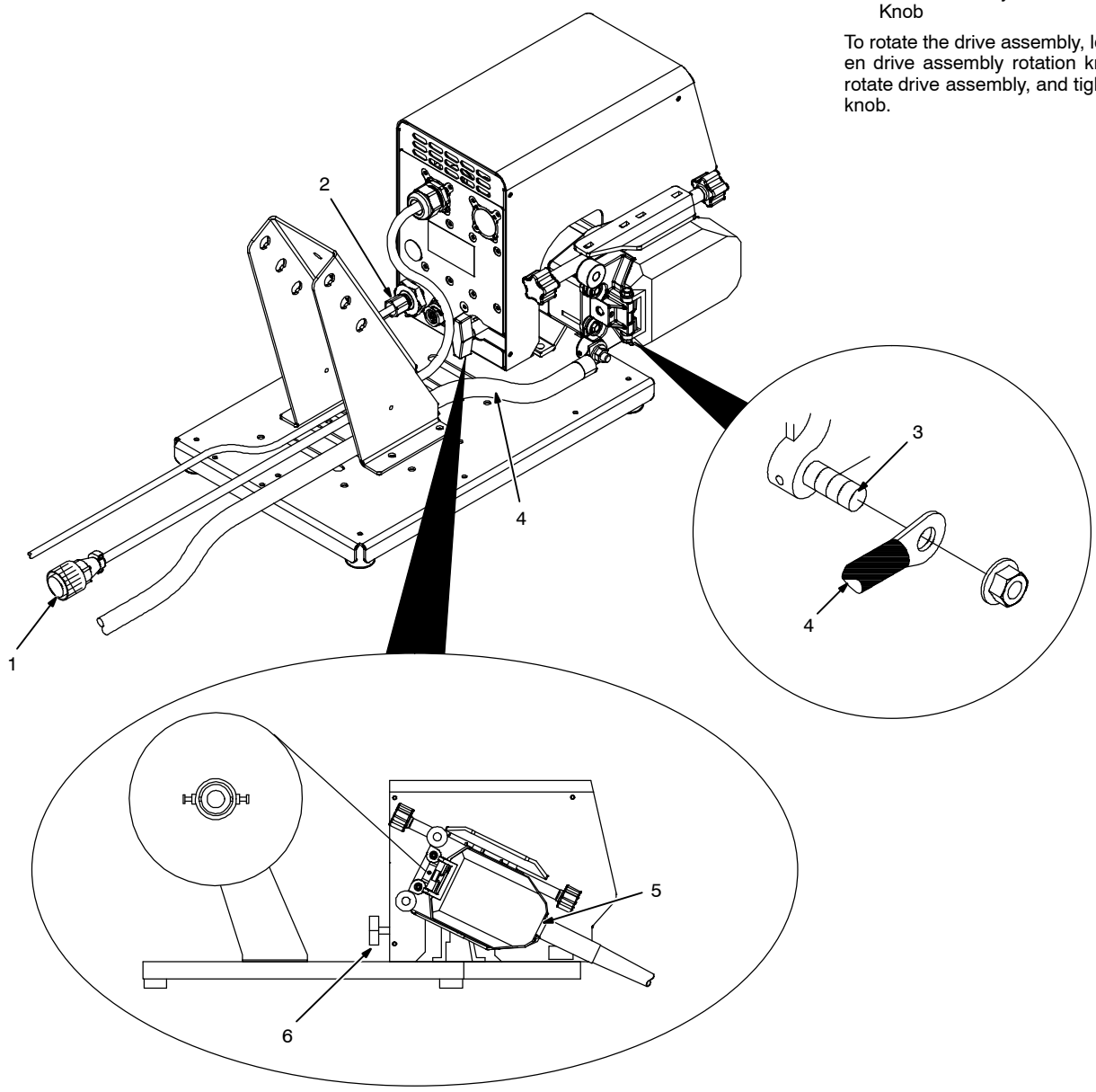
3 Weld Cable Terminal

4 Weld Cable

5 Drive Assembly

6 Drive Assembly Rotation Knob

To rotate the drive assembly, loosen drive assembly rotation knob, rotate drive assembly, and tighten knob.



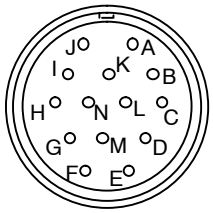
Tools Needed:

9/16, 5/8 in.

3/16 in.

246 041-A

4-7. 14-Pin Plug Information For Connecting Wire Feeder To Power Source

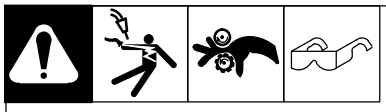
REMOTE 14	Pin*	Pin Information
	A	24 volts AC with respect to socket G.
	B	Contact closure to A completes 24 volts AC contactor control circuit.
	G	Circuit common for 24 volts AC circuit.
	C	+10 volts DC input from power source to wire feeder with respect to socket D.
	D	Remote control circuit common.
	E	0 to +10 volts DC output signal from wire feeder to power source with respect to socket D.
	H	Voltage feedback; 0 to +10 volts DC, 1 volt per 10 arc volts.
	F	Current feedback; 0 to +10 volts DC, 1 volt per 100 amperes.
	L	0 to +10 volts DC output signal from wire feeder to power source with respect to socket N.
	M	CC/CV select 0 to +10 volts DC.
	N	Feeder common.
	K	Not used.
*The remaining pins are not used.		

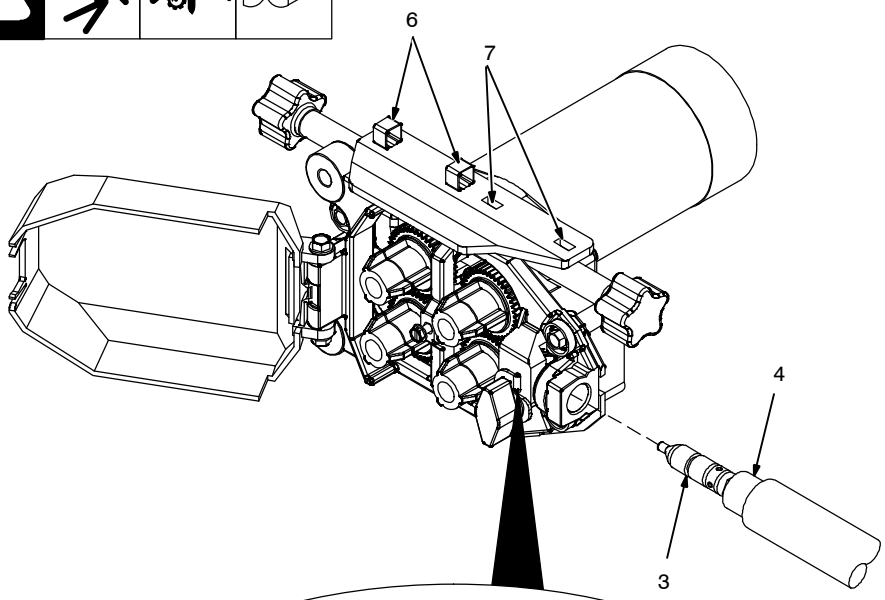
4-8. Wire Type, Size, And Optimal Wire Feed Speed Table

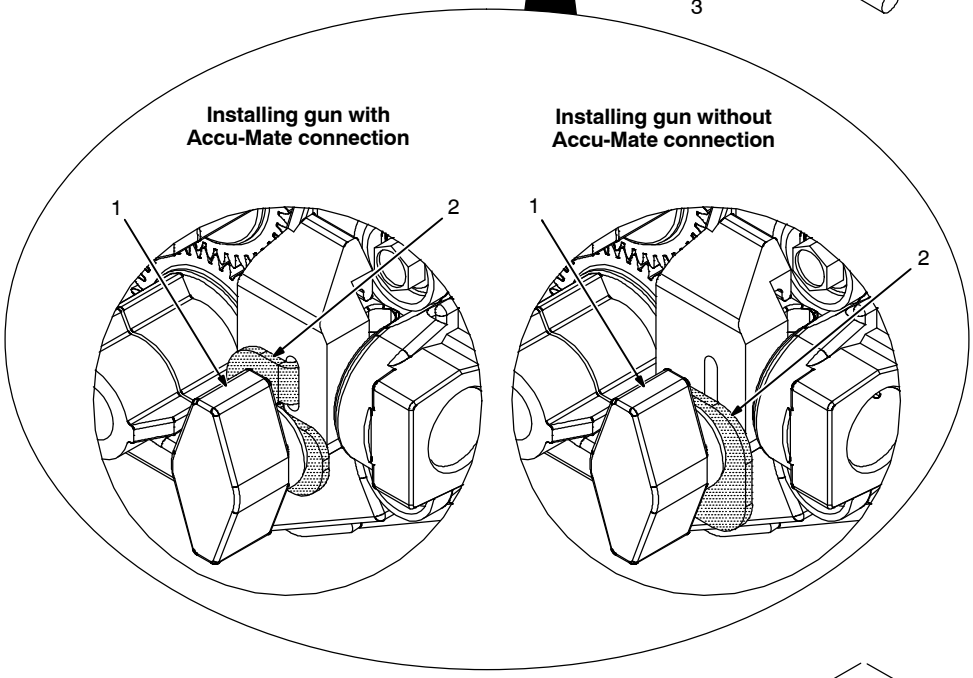
Motor Speed	Wire Type	Wire Size	Rated Speed Range (per IEC 60974–5)
Standard	All	.035 To .062 in. (0.9 To 1.57 mm)	55 To 770 ipm (1.4 To 19.6 mpm)
Standard	All	5/64 in. (2 mm)	55 To 700 ipm (1.4 To 17.8 mpm)

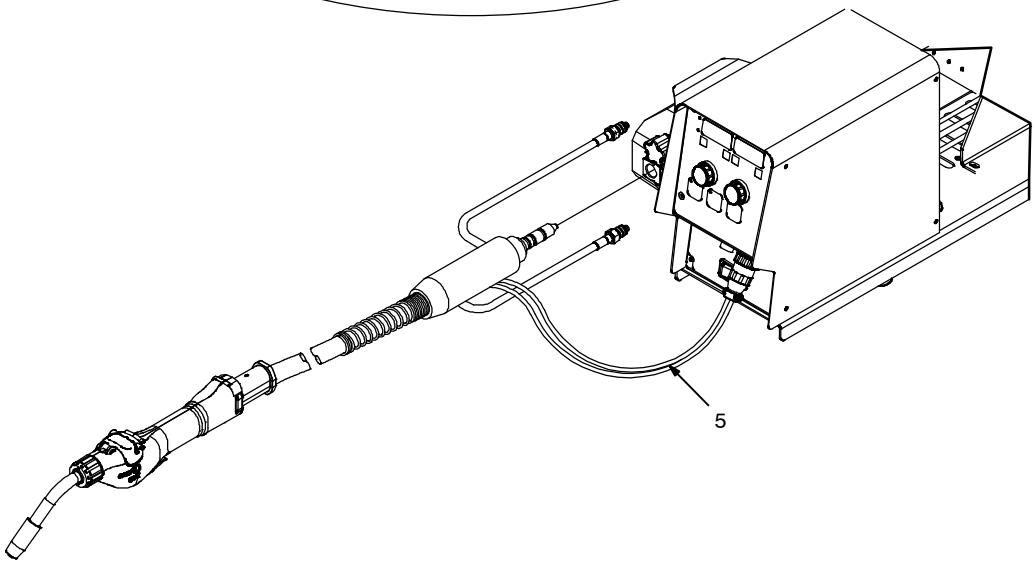
Notes

4-9. Installing Welding Gun









1 Power Clamp Knob

2 Gun Locking Tab

3 Power Pin Groove

4 Gun Connection End

Installing gun with Accu-Mate connection

Loosen power clamp knob to allow power pin of gun to clear the gun locking tab.

Push power pin into power clamp as far as possible to align the groove in the power pin of the gun with the gun locking tab.

Secure gun by tightening power clamp knob.

Installing gun without Accu-Mate connection

When using a gun without the groove in the power pin, loosen power clamp knob and rotate gun locking tab 180 degrees. This prevents the locking tab from extending into the power pin gun connection.

Push power pin into power clamp as far as possible.

Secure gun by tightening power clamp knob.

5 Gun Control Cable

Insert plug into Gun Control receptacle, and tighten threaded collar.

6 Pressure Blocking Clip

7 Empty Pressure Slots

Installing A Push/Pull Gun

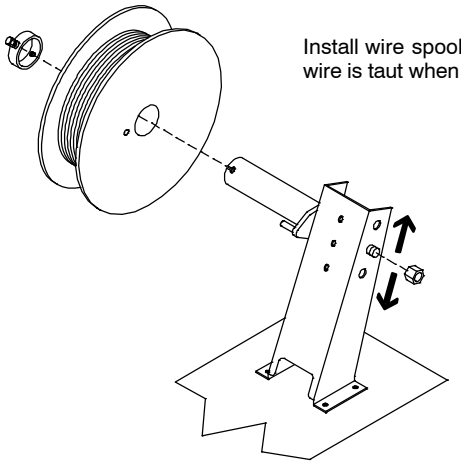
When using a push/pull gun, leave pressure blocking clips in position. Do not adjust pressure as shown in Section 4-10.

Installing A Push Only Gun

When using a push only gun, remove the blocking clips and place them in the empty pressure slots for storage and adjust pressure as shown in Section 4-10.

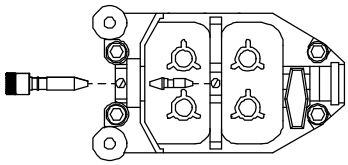
245 985-A / Ref. 246 040-A

4-10. Installing And Threading Welding Wire

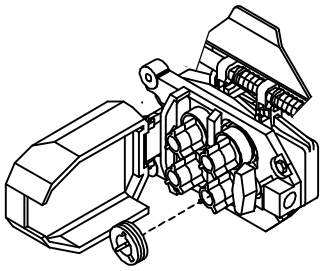


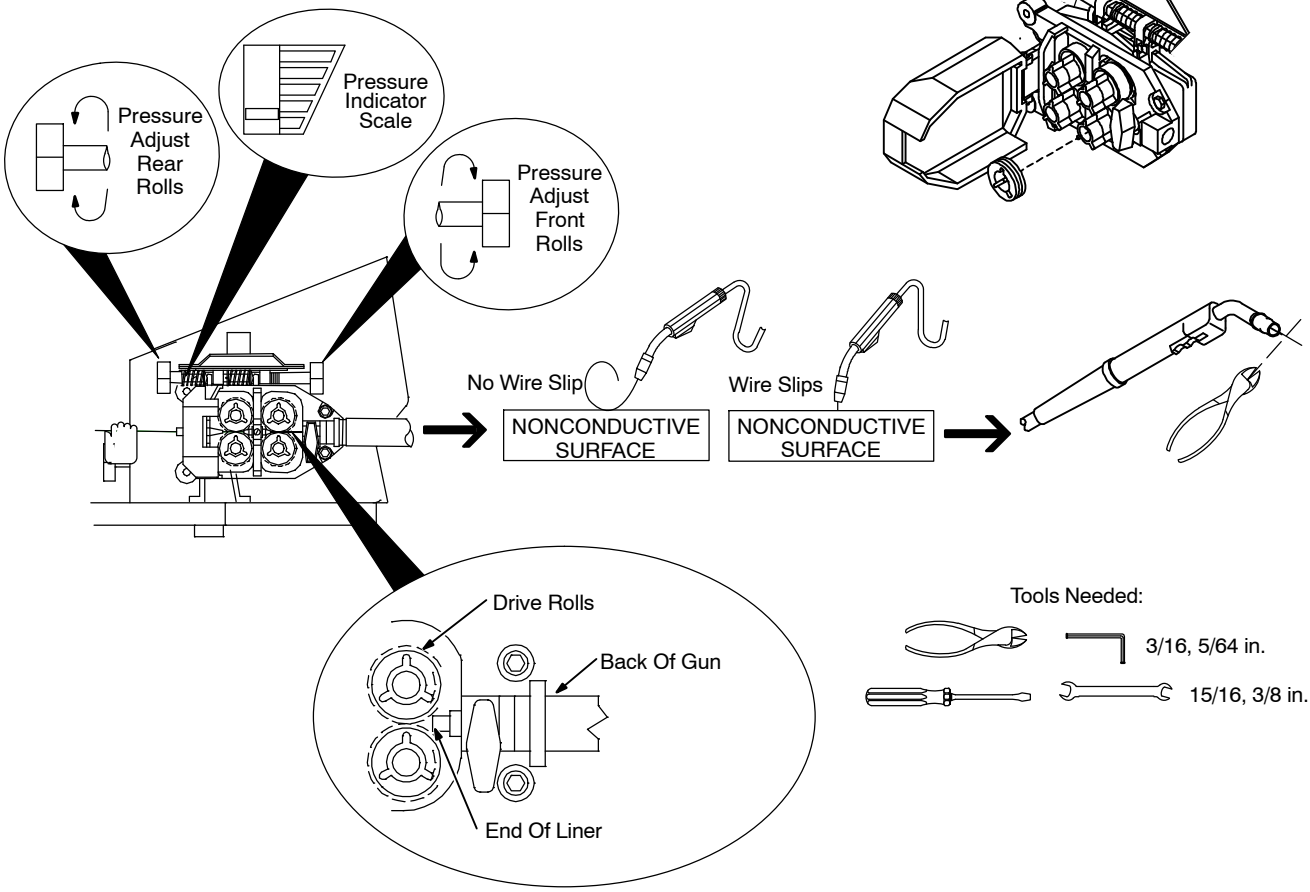
Install wire spool. Adjust tension nut so wire is taut when wire feed stops.

Install wire guides and anti-wear guide.



Install drive rolls.





Tools Needed:

☞ *For best wire feeding performance, be sure that the outlet cable has the proper size liner for the welding wire size being used. Also, when the gun is installed, the liner extending from the back of the gun should be as close to the drive rolls as possible, without touching.*

Install gun. Lay gun cable out straight. Cut off end of wire. Push wire through guides up to drive rolls; continue to hold wire. Press Jog button to feed wire out gun.

☞ *When using a push/pull gun and pressure blocking clips, do not adjust pressure.*

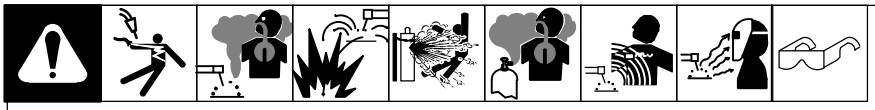
☞ *For aluminum wire set pressure indicator scale as light as possible.*

☞ *To adjust drive roll pressure, hold nozzle about 2 in (51 mm) from nonconductive surface and press gun trigger to feed wire against surface. Tighten knob so wire does not slip. Do not overtighten. If contact tip is completely blocked, wire should slip at the feeder (see pressure adjustment above).Cut wire off. Close cover.*

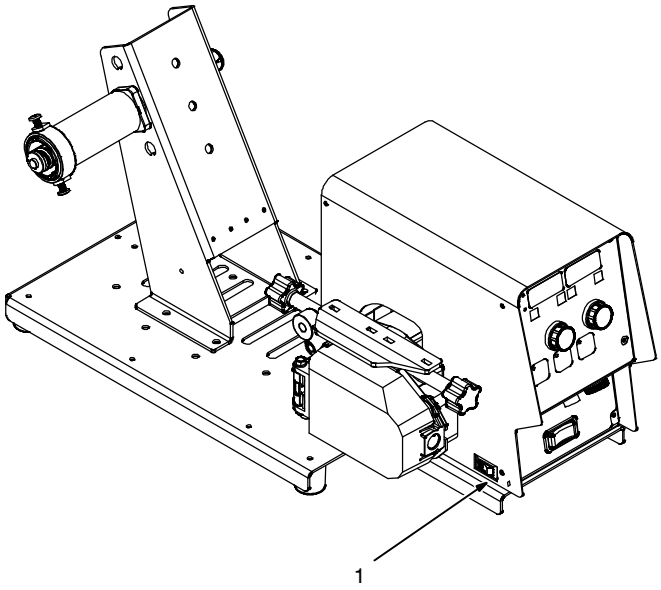
Ref. 156 929-A / Ref. 150 922 / Ref. 156 930 / S-0627-A

SECTION 5 – OPERATION

5-1. Power Switch

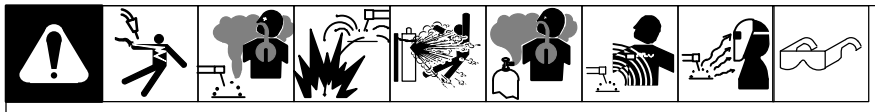


1 Power Switch

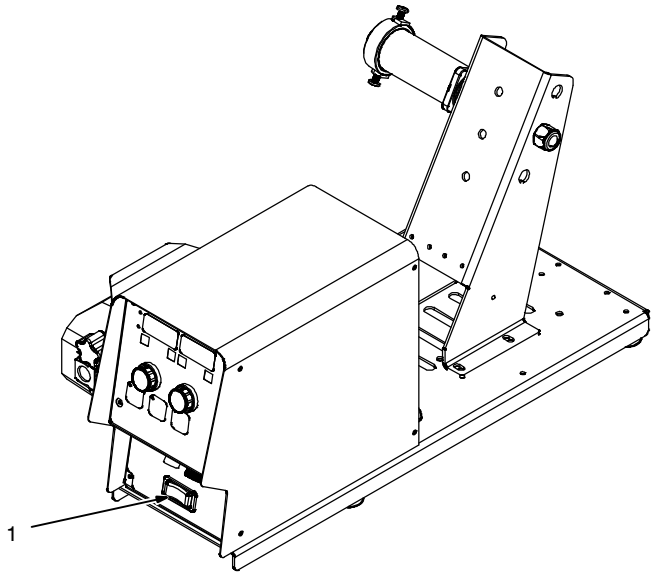


Ref. 246 039-A

5-2. Jog/Purge Switch



1 Jog/Purge Switch

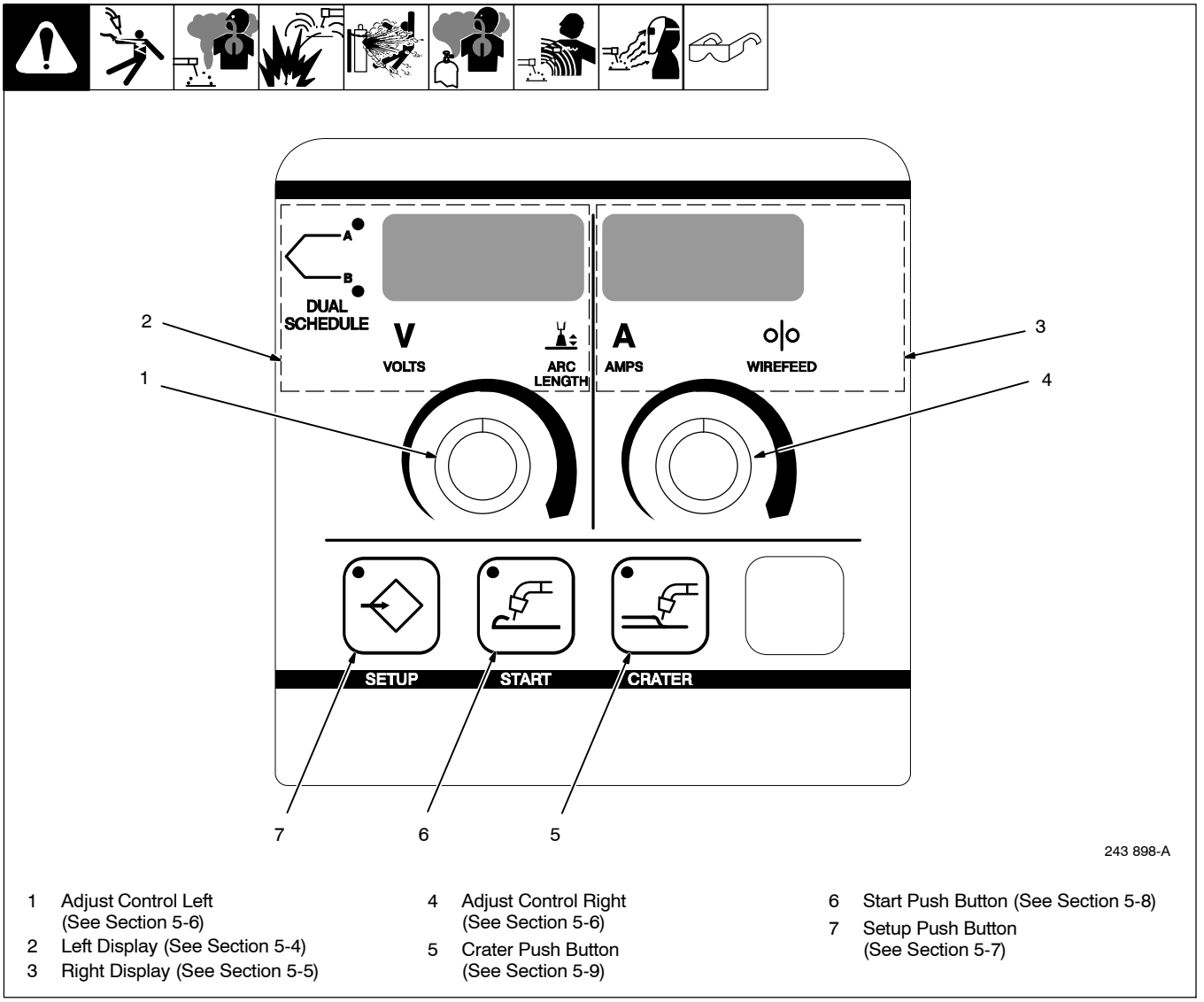


Ref. 246 039-A

Pressing the Jog/Purge switch allows the operator to jog wire without energizing the weld power or gas valve circuit.

- The unit provides the ability to jog the wire feeder by means of the gun trigger or the Jog/Purge switch.
- If the welding arc does not initiate in 3 seconds after the gun trigger is activated, the unit will perform a jog operation for a maximum of two minutes. If the gun trigger is still activated after two minutes, the jog operation is terminated to prevent complete despooling of the wire, in the case of a damaged gun.
- The unit displays the “TRIG ERR“ message to inform the operator that the trigger is activated.
- Jog speed can be adjusted by the Adjust control when the unit is jogging wire. The unit displays jog speed when the unit is being jogged.
- Jogging can also be accomplished by pressing the Jog/Purge button.
- Pressing the Jog/Purge button also allows the operator to purge gas lines before welding and to preset gas pressure at the regulator.

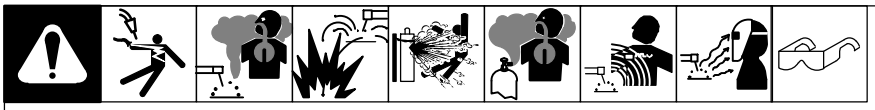
5-3. Front Panel Controls

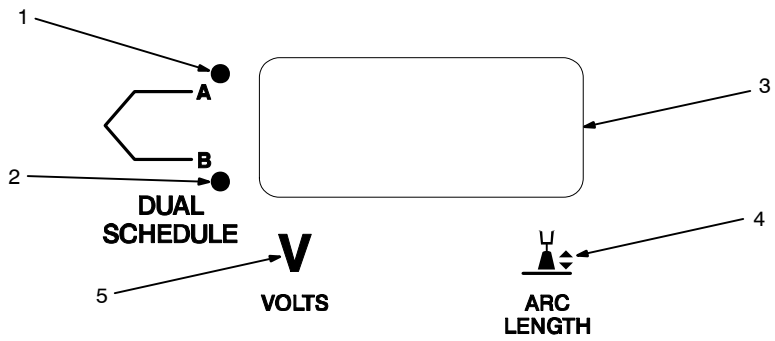


1 Adjust Control Left (See Section 5-6)
2 Left Display (See Section 5-4)
3 Right Display (See Section 5-5)
4 Adjust Control Right (See Section 5-6)
5 Crater Push Button (See Section 5-9)
6 Start Push Button (See Section 5-8)
7 Setup Push Button (See Section 5-7)

Notes

5-4. Left Display





1 Left Side Schedule A LED
2 Left Side Schedule B LED
3 Left Display
4 Arc Length LED
5 Volts LED

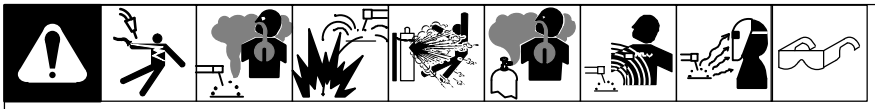
☞ *To set the correct voltage range for a particular power source, see Section 5-10 – Power Source Selection Menu.*

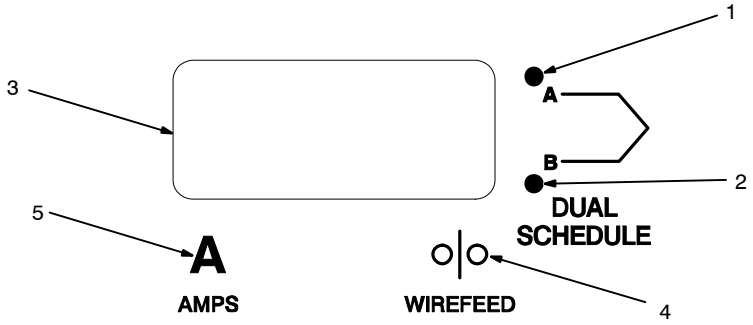
Left Display

The left display shows voltage or arc length. The unit displays both preset and actual arc voltage. When the unit is in a welding state, actual arc voltage is displayed.

☞ *See Section 7-2 for selection of arc length and voltage display.*

5-5. Right Display





1 Right Side Schedule A LED
2 Right Side Schedule B LED
3 Right Display

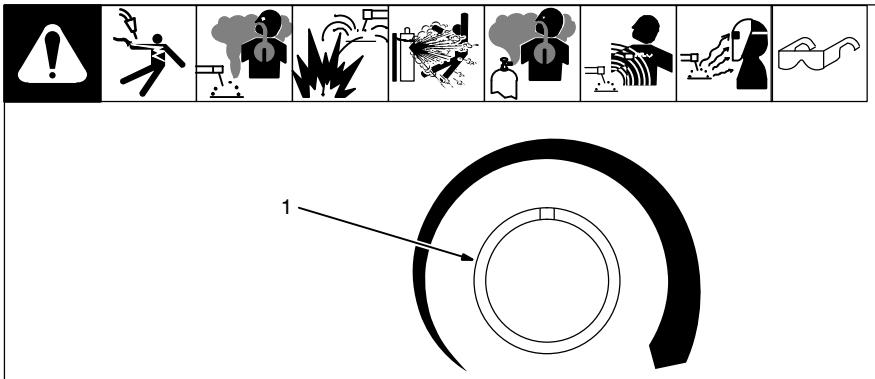
The right display shows wire feed speed or amperage. The unit displays and adjusts only preset wire feed speed at idle. When the unit is in a welding state, actual wire feed speed is displayed for the active welding sequence.

4 Wire Feed Speed LED
5 Amps LED

The LEDs below the display illuminate to indicate which value is being shown.

- If the unit is in a welding state that does not involve feeding wire, the unit displays the weld sequence wire feed speed. At any time during welding, the weld sequence wire feed speed can be adjusted and overrides the preset wire feed speed display. In other words, if the Adjust control is activated while welding, the unit displays and permits adjustment of the weld sequence wire feed speed regardless of the active welding sequence.
- When the unit is displaying amperage, the Amps LED illuminates. Amperage is only displayed if the unit is in a welding state and the amperage is above a minimum value of 25 Amps.

5-6. Adjust Control Left/Right



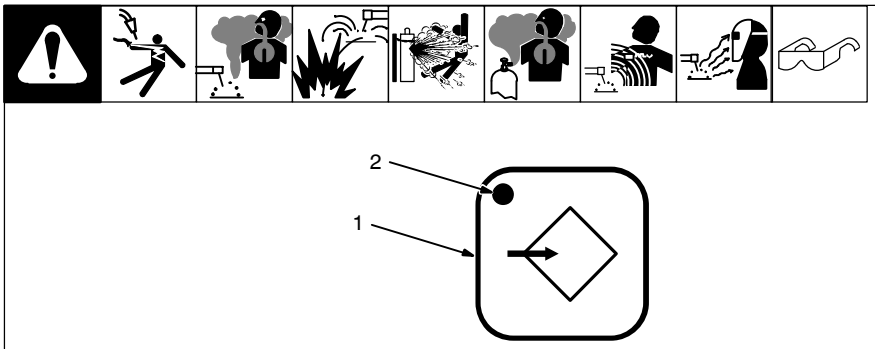
1 Adjust Control

Use Adjust control to change various parameters or menu items.

Use left control to adjust volts or arc length.

Use right control to adjust amperage or wire feed speed.

5-7. Setup Push Button



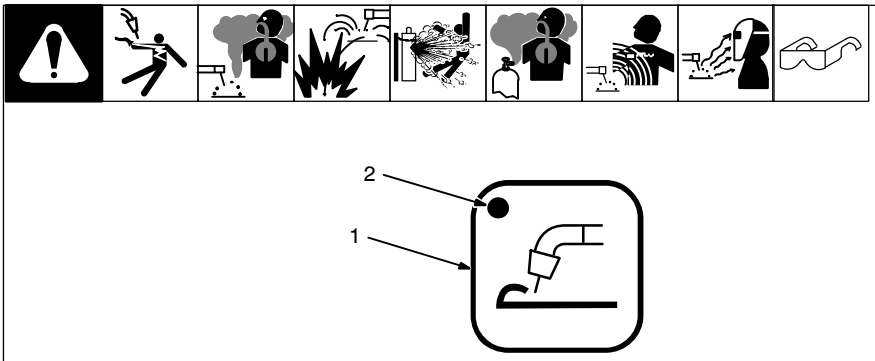
1 Setup Push Button

2 Setup LED

When the Setup button is pressed, the Setup push button LED turns on.

Press button to enter basic setup features. Hold button to enter more advanced setup features

5-8. Start Push Button

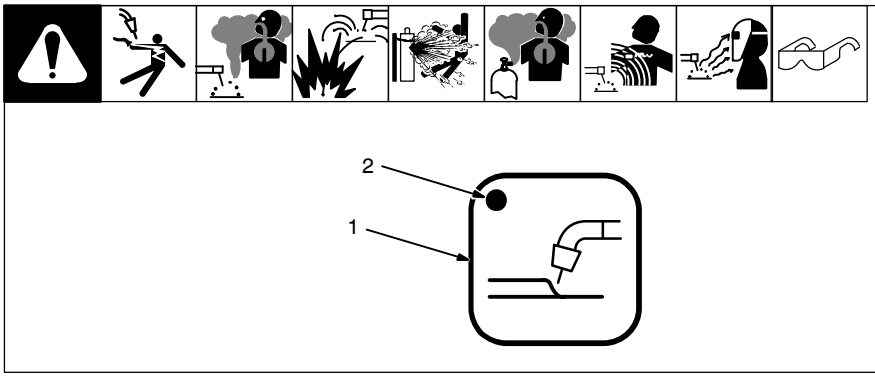


1 Start Push Button

2 Start LED

Press button to activate/deactivate start parameters. LED is on when start is enabled. Press and hold button for one second to access start parameter menu.

5-9. Crater Push Button

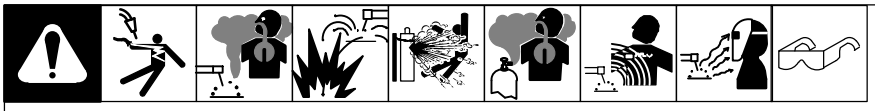


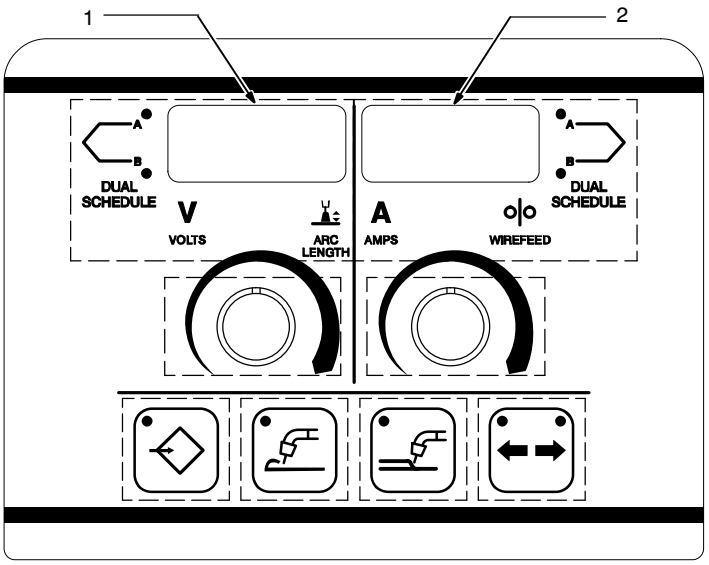
1 Crater Push Button

2 Crater LED

Press button to activate/deactivate crater parameters. Press and hold button for one second to access crater parameter menu.

5-10. Power Source Selection Menu





** Power Source	Left Display	Right Display	Voltage Range	
Invision 352 MPa	MPa	352	Vmin =10	Vmax =38
Invision/XMT 350 MPa	MPa	350	Vmin =10	Vmax =38
Deltaweld 302	DELT	302	Vmin =10	Vmax =32
Deltaweld 452	DELT	452	Vmin =10	Vmax =38
Deltaweld 652	DELT	652	Vmin =10	Vmax =44
Dimension 302	DIM	302	Vmin =10	Vmax =32
Dimension NT 450	DIM	450	Vmin =10	Vmax =38
Dimension 452	DIM	452	Vmin =10	Vmax =38
Dimension 652	DIM	652	Vmin =10	Vmax =65
XMT 304	XMT	304	Vmin =10	Vmax =35
XMT 350	XMT	350	Vmin =10	Vmax =38
XMT 456	XMT	456	Vmin =10	Vmax =38
Invision 456	INV	456	Vmin =10	Vmax =38
Invision 354	INV	354	Vmin =10	Vmax =35
Optima	OPT	IMA	Vmin =10	Vmax =38

**** For any power sources not listed, pick a matching voltage range or see Section 5-6 to set Vmin and Vmax.**

1 Left Display

2 Right Display

☞ *When the feeder is turned on, the Power Source Selection Menu allows the operator to select a default power source. Selecting a default power source, automatically sets the correct Vmin and Vmax settings for adjusting the output voltage of the power source.*

First Time Feeder Is Turned On

The feeder automatically goes into the Power Source Selection Menu. The feeder displays “MPA” on the Left Display and “352” on the Right Display, meaning that a MPa 352 is the default power source, and has a voltage range of 10V as Vmin and 38V as Vmax.

At power up, the operator has three seconds to select a default power source from the list shown on the display. Operator may scroll through the list of power sources by using the Adjust control. After selecting a power source the operator has three seconds to change to a different power source or begin welding. When turning off the feeder, the default power source will be retained.

Next Time Feeder Is Turned On

The feeder will display the last selected default power source. The operator has three seconds to select another power source, or press the Program Button to exit the Power Source Selection Menu.

5-11. Operational Terms

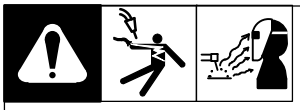
The following is a list of terms and their definitions as they apply to this wire feeder:

General Terms:

Cold Wire Jog	Feeding wire without contactor or gas valve being energized.
Sequence	A portion of the weld program, such as preflow, run-in, start, weld, crater, burnback, and postflow.
Weld Program	A group of sequences that make up a weld cycle.
MIG	CV weld process with individual settings of voltage and wire feed speed.
Pulsed MIG	CC weld process with factory taught data using peak and background current, pulse width and pulses per second. Adaptive pulse control methods modulate one or more of the taught data parameters to regulate or maintain a fixed arc length.
Synergic	Refers to the system's ability to match the power setting to the set wire feed speed using a single knob control. In synergic Pulsed MIG, the pulse parameters are automatically increased or decreased to match the power output to the set wire feed speed.
Non- Synergic	Refers to independent control of wire feed speed and power output. In non–synergic mode, increasing or decreasing the set wire feed speed requires corresponding adjustment of the arc length or voltage setting.
STD	Basic trigger function, weld sequence starts when the trigger is pressed and ends when the trigger is released.
Trigger Hold	Trigger function allowing the operator to weld without continuously pressing the gun trigger. In Trigger Hold mode, momentarily press the gun trigger until an arc is established, and welding will continue until the gun trigger is momentarily pressed again.
Spot	Trigger function that automatically shuts the weld off after a set amount of time. The weld will end when the set time has expired or the trigger has been released, which ever occurs first. The spot time is reset when the trigger is released.
Arc Length	Refers to physical distance between wire electrode and molten puddle. Term also used to represent adjustments in the Pulsed MIG weld process.
Dual Schedule	Allows selecting a pair of weld parameter settings that can be used together.
Preflow	The amount of time that the shielding gas will flow after the trigger is pressed and before the welding arc will be allowed to be active.
Postflow	The amount of time that the shielding gas will flow after the arc has been shut off.
Start	Provides voltage/arc length, wire feed speed and time values for modified arc start.
Profile Pulse	Profile Pulse optimizes aluminum weld bead appearance by producing welds with consistently spaced ripple patterns, similar to GTAW.

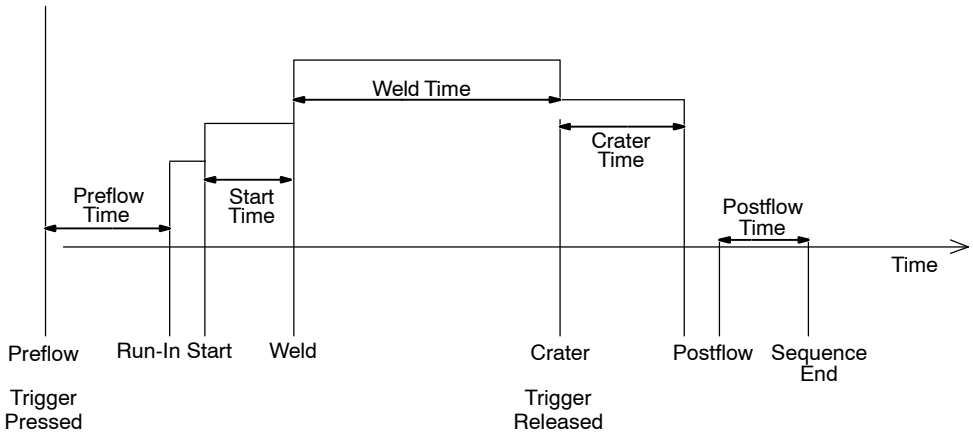
SECTION 6 – SETTING SEQUENCE PARAMETERS

6-1. Sequence Parameters In A Program



Sequence	Parameters		
	Volts	IPM	Seconds
1. Preflow			0-5.0
2. Run-In		X	x0.1-x1.00
3. Start	X	X	.1-.5
4. Weld	X	X	0-100.0
5. Crater	X	X	0.00-5.00
6. Postflow			0.0-10.0

X = Setting available.



SECTION 7 – PROGRAMMING

7-1. Setup Menu

To enter the **SETUP MENU** press and release the **SETUP** button. The **SETUP MENU INDICATOR** and the **SETUP BUTTON INDICATOR** will illuminate.

Rotate the **LEFT ADJUST KNOB** to select different menu items shown in the **LEFT DISPLAY**. Rotate the **RIGHT ADJUST KNOB** to change menu item values shown in the **RIGHT DISPLAY**.

To exit the **SETUP MENU** press and release the **SETUP** button.

Items that can be adjusted in this menu are:

Trigger Control (TRIG) – Sets the gun trigger control. The trigger control can be configured as (STD, HOLD, or SPOT).

Trigger Hold Delay (HOLD) – Additional trigger setting only appearing in the menu when the trigger control is set to (TRIG HOLD). Trigger hold delay time is the minimum amount of time the trigger must be held for trigger hold to become active. There is a built in maximum trigger hold time which the trigger must be released within for trigger hold to become active. The maximum trigger hold time is always 4.0 seconds after the trigger hold delay time. For Example, if the trigger hold delay time is set to 2.0 seconds, the trigger must be held for at least 2.0 seconds and released within 6.0 seconds for trigger hold to become active. Once the trigger hold function is active, the wire feeder will continue feeding wire until the trigger is pressed and released again.

Trigger Spot Time (SPOT) – Additional trigger setting only appearing in the menu when the trigger control is set to (TRIG SPOT). The SPOT time is the length of combined time for the start (if applicable) and the weld sequence. The weld will end when the set time has expired or the trigger has been released, whichever occurs first. The spot time is reset when the trigger is released.

Preflow (PRE) – The amount of time that the shielding gas will flow after the trigger is pressed and before the welding arc will be allowed to be active. Range of this setting is from (0.0 to 5.0) seconds.

Postflow (POST) – The amount of time that the shielding gas will flow after the arc has been shut off. Range of this setting is from (0.0 to 10.0) seconds.

Run–In Speed (R–IN) – The wire feed speed prior to the welding arc being struck. This setting is a percentage of the wire feed speed the unit is set to for welding. Range of this setting is from (X0.10 to X0.99 to OFF). Example: If the weld wire speed is 200 and R–IN is X0.50, the run–in wire speed is 100.

Profile Pulse ON/OFF – When Profile Pulse is On, the pulse parameters and wire speed are coordinated to produce a consistent ripple pattern.

☞ *Additional PROFILE PULSE menu items may appear in the **SETUP MENU** when PROFILE PULSE is active. See Section 7-5.*

Notes

7-2. Setup Menu Level 2

To enter the **SETUP MENU LEVEL 2** press and hold the **SETUP** button. The **SETUP MENU INDICATOR** and the **SETUP BUTTON INDICATOR** will illuminate.

Rotate the **LEFT ADJUST KNOB** to select different menu items shown in the **LEFT DISPLAY**. Rotate the **RIGHT ADJUST KNOB** to change menu item values shown in the **RIGHT DISPLAY**.

To exit the **SETUP MENU LEVEL 2** press and release the **SETUP** button.

Items that can be adjusted in this menu are:

Parameter Lock (LOCK) – When set to (ON), the Preflow, Postflow, Run–In, Start, and Crater parameters are locked and cannot be adjusted. Attempting to change a locked parameter causes the display to momentarily display (LOCK).

Range Limits (LMTS) – When set to (ON), the wire feed speed and arc length or voltage weld settings are limited to minimum and maximum adjustable ranges. The minimum and maximum range settings appear next in the menu when (LMTS) is set to (ON). When set to (OFF), range limits are inactive and do not appear in the menu.

Wire Feed Range Limit (MIN) – Indicated in the LEFT DISPLAY with the WIREFEED SPEED INDICATOR illuminated. Sets the minimum wire feed speed. Range of this setting is from 50 to 780 IPM.

Wire Feed Range Limit (MAX) – Indicated in the LEFT DISPLAY with the WIREFEED SPEED INDICATOR illuminated. Sets the maximum wire feed speed. Range of this setting is from (MIN) setting to 780 IPM.

Arc Length Range Limit (MIN) – Indicated in the LEFT DISPLAY with the ARC LENGTH INDICATOR illuminated. Sets the minimum arc length. Range of this setting is from 0 to 100.

Arc Length Range Limit (MAX) – Indicated in the LEFT DISPLAY with the ARC LENGTH INDICATOR illuminated. Sets the maximum arc length. Range of this setting is from (MIN) setting to 100.

☞ *When the DISP option in the SETUP MENU LEVEL 2 is set to (VOLT), the Arc Length Range Limits are replaced by Voltage Range Limits.*

Voltage Range Limit (MIN) – Indicated in the LEFT DISPLAY with the VOLTS INDICATOR illuminated. Sets the minimum voltage. Range of this setting is dependent on the power source voltage range in the MIG process.

Voltage Range Limit (MAX) – Indicated in the LEFT DISPLAY with the VOLTS INDICATOR illuminated. Sets the minimum voltage. Range of this setting is dependent on the power source voltage range in the MIG process.

Display (PULS) – Allows the preset weld parameter adjustment to be set as voltage or arc length. This setting effects only the display appearance and will not effect operation. The (PULS) setting should be set to match the power source display. When set to (VOLT), the preset voltage set point will be shown in the Left Display with the VOLTS INDICATOR illuminated. When set to (ARC.L), the preset arc length will be shown in the Left Display with the ARC LENGTH INDICATOR illuminated.

Trigger Schedule Select (SCHD) – Allows the operator to select the alternative schedule by quickly tapping the gun trigger when not welding. When set to (OFF), trigger schedule select is disabled. When set to (TRIG), the schedule is selected by tapping the gun trigger when not welding. The pulling and release of the gun trigger must happen within 0.2 seconds for the schedule to change.

Menu Lock Code (CODE) – Allows setting a numerical password code to obstruct access to the Setup Menu Level 2. By default, (CODE) is (OFF) allowing access to the menu without entering a password. The password can be programmed to values between 0 and 999. Once programmed, the password must be re–entered each time the menu is accessed. A failed password attempt causes the display to momentarily show (CODE FAIL). (CODE) will continue to show on the display until the correct password is entered or the power is cycled.

☞ *Anytime the menu is exited with (CODE OFF), a special sequence is required before a new password can be set. With (CODE OFF) shown on the display, press and hold the SETUP button and rotate the RIGHT ADJUST KNOB to set the password to (0123). Release the SETUP button, the display should read (CODE 0000). The password can now be set to a new value.*

Weld Time – This setting displays weld time for each feeder side. You can scroll through the menu by rotating the right knob in the menu. Left side time, right side time then total time are displayed sequentially.

Weld Runs – This setting displays weld cycles for each feeder side. You can scroll through the menu by rotating the right knob in the menu. Left side cycles, right side cycles then total weld cycles are displayed sequentially.

Life Zero – This setting will erase left and right weld time and weld cycles. Total time and total cycles are not reset. Time reset is initialized by rotating the right knob which initiates a second counter. When “Life Done” is displayed you must exit the menu by pressing the setup button. The 5 second counter can be reset by rotating the right knob back before “Life Done” is displayed.

Power Source Menu (P.MEN) – This setting turns the power on power source menu “ON” or “OFF” at power up.

Product Version Information (INFO) – Provides information about the firmware revision levels for the Motor Control and the User Interface PCBs. The default value is (INFO NONE). To read the firmware versions rotate the Right Adjust Knob until the display reads (INFO MOTR) or (INFO FRNT). The corresponding firmware revision level will momentarily appear following a short delay.

7-3. Setting A Start Sequence

To turn on a Start sequence, press the **START** button. The **START ON INDICATOR** will illuminate indicating Start is active.

To turn off the Start sequence, press the **START** button**.** The **START ON INDICATOR** will turn off indicating Start is inactive.

☞ *The factory default mode for Start is (DFLT). The (DFLT) setting has preset parameters. Start can also be set to (MAN) for manual settings. The Start mode can be changed in the* ***START MENU****.*

☞ *Following are START (DFLT) parameters for the active schedule.*

To enter the **START MENU** press and hold the **START** button until the **START MENU INDICATOR** illuminates.

Rotate the **LEFT ADJUST KNOB** to select different menu items shown in the **LEFT DISPLAY**. Rotate the **RIGHT ADJUST KNOB** to change menu item values shown in the **RIGHT DISPLAY**.

To exit the **START MENU,** press and release the **START** button.

Items that can be adjusted in this menu are:

Start Wire Feed Speed (WFS) – Sets the wire feed speed used during the Start Time. This setting is a percentage of the wire feed speed the unit is set to for welding. Range of this setting is from (X0.5 to X2.50). Example: If the weld wire feed speed is 200 and WFS is X1.50, the Start Wire Feed Speed is 300.

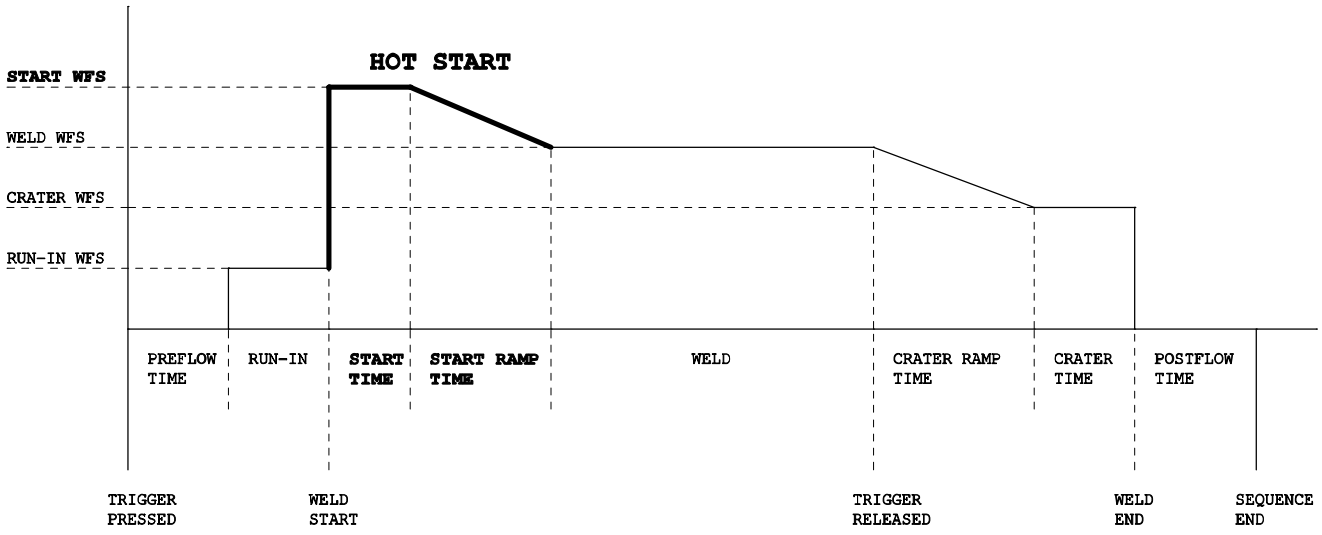
Start Arc Length (ARC.L) – Sets the arc length longer or shorter during the Start Time. This setting is a percentage of the arc length the unit is set to for welding. Range of this setting is from (X0.50 to X1.50). Example: If the weld arc length is set to 50 and ARC.L is X0.50, the Start Arc Length is 25.

☞ *When the DISP option in the* ***SETUP MENU LEVEL 2*** *is set to VOLT, the Start Arc length setting will be replaced by the Start Voltage (VOLT) setting.*

Start Voltage (VOLT) – Sets the voltage during the Start Time. Range of this setting is dependent on the power source voltage range in the MIG process, and varies with the selected wire and gas program in the PULSED MIG process. If the power source weld process is set to PULSED MIG, the Start Voltage setting will change if the wire and gas program selection is changed.

Start Time (TIME) – The amount of time the wire feed speed is active at the Start setting. Range of this setting is from (0.1 to 0.5) seconds.

Start Ramp Time (RAMP) – The amount of time it takes to transition from the Start to the weld wire feed speed setting. Range of this setting is from (0.1 to 5.0) seconds.



7-4. Setting A Crater Fill Sequence

To turn on Crater Fill, press the **CRATER** button. The **CRATER ON INDICATOR** will illuminate indicating Crater Fill is active.

To turn off Crater Fill, press the **CRATER** button. The **CRATER ON INDICATOR** will turn off indicating Crater Fill is inactive.

☞ *The factory default mode for Crater Fill is (DFLT). The (DFLT) setting has preset parameters. Crater Fill can also be set to (MAN) for manual settings. The Crater mode setting can be changed in the CRATER MENU.*

☞ *The Crater Tack Time (TACK) is adjustable in both AUTO and MAN modes.*

To enter the **CRATER MENU** press and hold the **CRATER** button until the **CRATER MENU INDICATOR** illuminates.

Rotate the **LEFT ADJUST KNOB** to select different menu items shown in the **LEFT DISPLAY**. Rotate the **RIGHT ADJUST KNOB** to change menu item values shown in the **RIGHT DISPLAY**.

To exit the **CRATER MENU** press and release the **CRATER** button.

Items that can be adjusted in this menu are:

Crater Wire Feed Speed (WFS) – Sets the Crater Fill wire feed speed. This setting is a percentage of the wire feed speed the unit is set to for welding. Range of this setting is from (X0.30 to X1.00). Example: If the weld wire feed speed is 200 and WFS is X0.50, the Crater Wire Feed Speed is 100.

Crater Arc Length (ARC.L) – Sets the arc length longer or shorter during the Crater Fill Time. This setting is a percentage of the arc length the unit is set to for welding. Range of this setting is from (X0.50 to X1.50). Example: If the weld arc length is set to 50 and ARC.L is X0.50, the Crater Arc Length is 25.

☞ *When the DISP option in the **SETUP MENU LEVEL 2** is set to VOLT, the Crater Arc Length setting will be replaced by the Crater Voltage (VOLT) setting.*

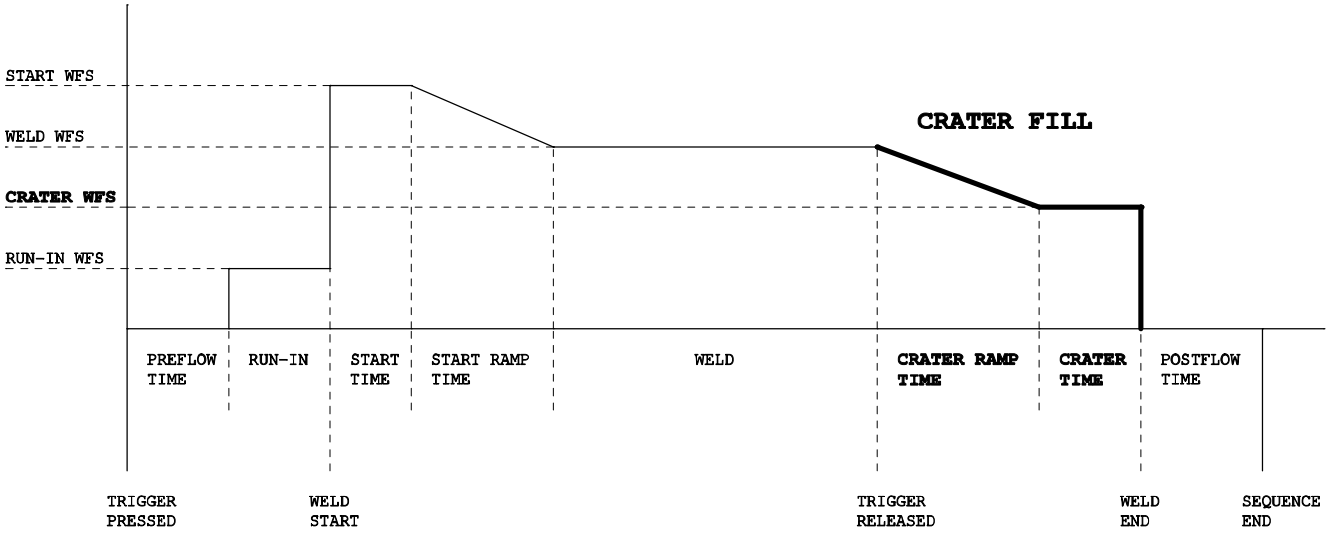
Crater Voltage (VOLT) – Sets the voltage during the Crater Fill time. Range of this setting is dependent on the power source in the MIG process, and varies with the selected wire and gas program in the PULSED MIG process. If the power source weld process is set to PULSED MIG, the Crater Voltage setting will change if the wire and gas program selection is changed.

Crater Ramp Time (RAMP) – The amount of time it takes to transition from the weld to the Crater wire feed speed setting. Range of this setting is from (0.1 to 5.0) seconds.

Crater Fill Time (TIME) – The amount of time the wire feed speed is active at the Crater setting. Range of this setting is from (0.1 to 5.0) seconds.

Crater Tack Time (TACK) – This setting is for tack welding without crater fill. The Crater fill will not be active if the arc time is less than the set time. Range of this setting is from (0.1 to 5.0) seconds.

Crater Factory Default (DFLT) – To reset crater to factory default settings select (DFLT). Range of this setting is from (5 to 0) seconds.



7-5. Profile Pulse

Profile Pulse optimizes Aluminum weld bead appearance by producing welds with consistently spaced ripple patterns, similar to GTAW. This feature has been designed to operate in a Synergic Pulsed MIG system. The consistent ripple pattern is achieved by periodically changing both the wire feed speed and power level. The average wire feed speed is determined by the value the unit is set to for welding.

Profile Pulse Items that can be adjusted in the Setup Menu are:

Profile Pulse ON/OFF (PROF) – Allows Profile Pulse to be turned on or off.

Profile Pulse Frequency (P.FRQ) – Sets the spacing between ripples in the weld bead. Range of this setting is from (0.1 to 5.0) pulses per second. See Figures 1 and 2 below.

Profile Pulse Wire Feed Speed Change (P.WFS) – Sets the percentage of change above and below the wire feed speed the unit is set to for welding. Range of this setting is (X0.00 to X0.30). Example: If the wire feed speed is 200 and (P.WFS) is set to (X0.10), the wire feed speed will alternate between 180 and 220 ipm.

Profile Pulse Arc Length (P.AL) – Sets an arc length correction factor for the lower wire feed speed. This setting is a percentage of the arc length the unit is set to for welding. Range of this setting is from (X0.5 to X1.5). Example: If the arc length for welding is set to 50 and (P.AL) is set to (X1.1), the arc length setting for the lower wire feed speed is 55.

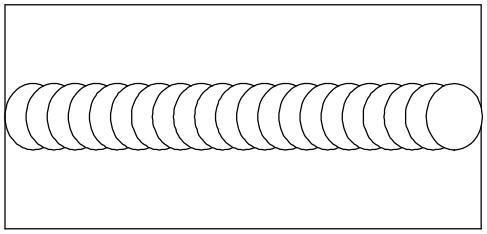


Figure 1
Constant travel speed with P.FRQ set to 0.1

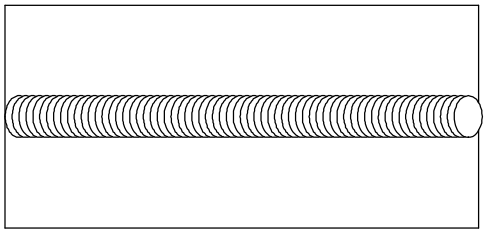
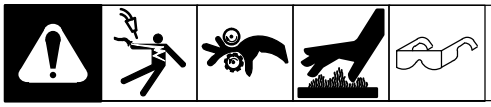


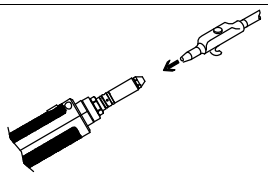
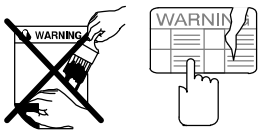
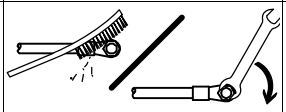
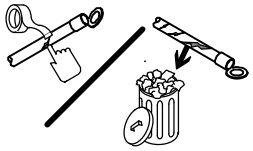
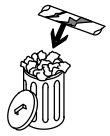
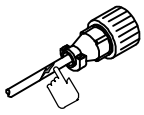
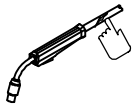
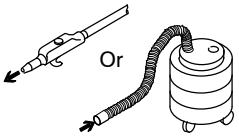
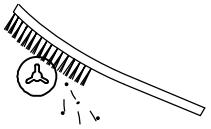
Figure 2
Constant travel speed with P.FRQ set to 5.0

SECTION 8 – MAINTENANCE & TROUBLESHOOTING

8-1. Routine Maintenance



Disconnect power before maintaining.

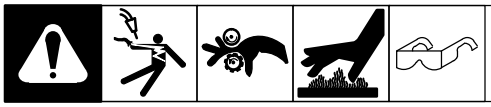
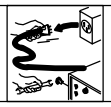
	✓ = Check ● = Clean ☆ = Replace				
Every Spool of Wire or Wire Change	 ✓● Gun Liner				
Every 3 Months	 ☆ Unreadable Labels	 ● Weld Terminals	 ✓☆ Weld Cable	 ☆ Cracked Parts	
	 ✓ 14-Pin Cord	✓ Gas Hose and Fittings	 ✓ Gun Cable		
Every 6 Months	 ● Inside Unit	 ● Drive Rolls			

8-2. Diagnostics

The following error messages are shown on the displays to indicate specific errors. Explanations are in the text below:

TRIG	**ERR**	Indicates a trigger error. A trigger error occurs if the user has the trigger held for more than two minutes without striking an arc. This error also occurs if the trigger is held when the feeder is powered up. The error may be cleared by releasing the trigger.
JOG	**ERR**	Indicates a jog switch error. A jog switch error occurs if the user has the jog switch held for more than two minutes. This error also occurs if the jog switch is held when the feeder is powered up. The error may be cleared by releasing the jog switch.
PURG	**ERR**	Indicates a purge switch error. A purge switch error occurs if the user has the purge switch held for more than one minute. This error also occurs if the purge switch is held when the feeder is powered up. The error may be cleared by releasing the purge switch.
COOL	**ERR**	Indicates a water flow switch error. A water flow switch error occurs if no water flow is detected while the trigger is pressed. Jog and purge switches will behave normally even if no water flow is detected. Dip switch 2 on the motor control pcb must be set to enable this error. The error is cleared when water flow is detected or when the error is disabled.
TEST	**ERR.1 or ERR.2**	Indicates a power on self diagnostic test error. The number provides information regarding the error. If this error occurs, contact a Factory Authorized Service Agent.
COMM	**ERR**	Indicates a serial communication error. A communication error occurs 2 seconds after a loss of communication between the motor control pcb and the front panel pcb.
1234	**ERR.M**	Indicates a motor control pcb error. If this error occurs, contact a Factory Authorized Service Agent.
1234	**ERR.F**	Indicates a front panel pcb error. If this error occurs, contact a Factory Authorized Service Agent.
R.Tac	**ERR**	Indicates the right push motor tachometer circuit has an error.
L.Tac	**ERR**	Indicates the left push motor tachometer circuit has an error.
G.Tac	**ERR**	Indicates tachometer in push-pull gun has an error.

8-3. Troubleshooting

Disconnect power before troubleshooting.

Trouble	Remedy
Pressing gun trigger does not energize feeder. Shielding gas does not flow and wire feeder does not feed.	Secure plug from gun control cable into Gun Control receptacle on feeder (see Section 4-9).
	Have nearest Factory Authorized Service Agent check optional water flow switch, if applicable.
Wire feeds, shielding gas flows, but welding wire is not energized.	Check to see if ground clamp or weld cable is connected.
Wire feeds erratically.	Verify proper wire size is selected (see Section 7-2).
	Check drive roll pressure in wire feeder and gun (see Section 4-10).
	Clean or replace drive rolls as necessary.
	Check and replace liner if necessary.
Arc varies and welding wire is kinked when feeding out gun.	Verify proper wire size is selected (see Section 7-2).
No weld output; gun/feeder does not work.	Check gun control cable connection on wire feeder front panel (see Section 4-9).
Erratic weld output.	Tighten and clean all connections.
	Replace contact tip.
	Verify proper wire size is selected (see Section 7-2).
	Check drive roll pressure in wire feeder and gun (see Section 4-10).
	Check and replace liner if necessary.
	When welding aluminum, it is important to use minimal drive roll pressure and minimal brake tension to achieve consistent wire feeding.
Wire does not feed; burnback in contact tip.	Verify drive roll size is correct.
	Check drive roll pressure in wire feeder and gun (see Section 4-10).
	Check and replace liner if necessary.
Gun overheating (water-cooled models).	Be sure coolant flow rate is at least 1 qt/min.
	Corrosion buildup in gun decreasing coolant flow rate. Backflush coolant system, clean coolant system filter, and clean fittings.
Motor does not run.	Check drive roll pressure in wire feeder and gun (see Section 4-10).
	Check and replace liner if necessary.
	Have Factory Authorized Service Agent check feeder.
Gun Calibration G. Cal ERR.1	Straighten gun cable.
	Check drive roll pressure in wire feeder and gun (see Section 4-10).
	Verify proper wire size is selected (see Section 7-2).
	Check and replace liner if necessary.
	Have Factory Authorized Service Agent check tach feedback.
Gun Calibration G. Cal ERR.2	Verify wire is fed thru contact tip.
	Check drive roll pressure in wire feeder and gun (see Section 4-10).
	Verify drive roll size is correct.
	Have Factory Authorized Service Agent check tach feedback.

Notes

SECTION 9 – ELECTRICAL DIAGRAM

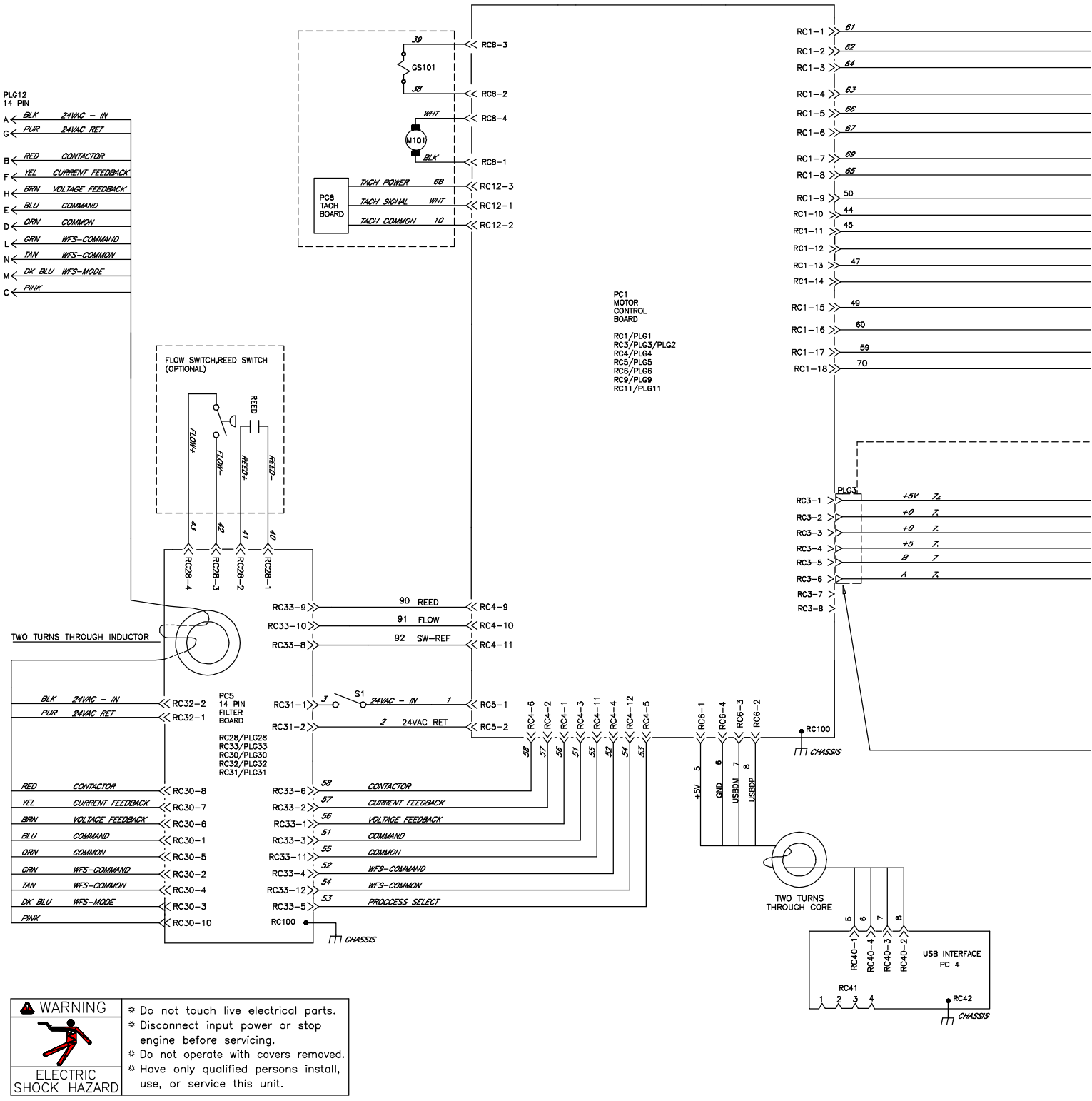
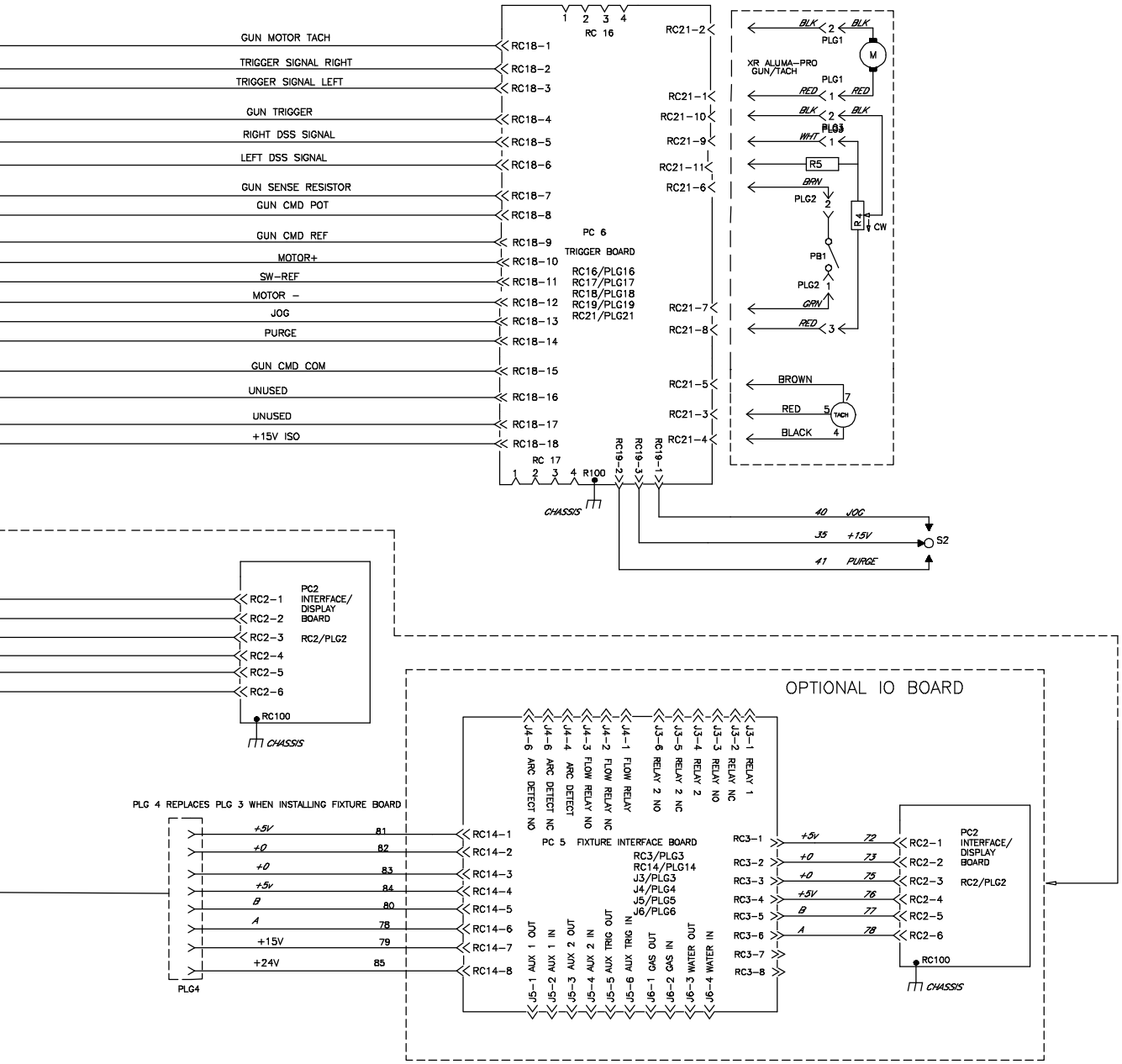


Figure 9-1. Circuit Diagram


GUN MOTOR TACH
TRIGGER SIGNAL RIGHT
TRIGGER SIGNAL LEFT
GUN TRIGGER
RIGHT DSS SIGNAL
LEFT DSS SIGNAL
GUN SENSE RESISTOR
GUN CMD POT
GUN CMD REF
MOTOR+
SW-REF
MOTOR -
JOG
PURGE
GUN CMD COM
UNUSED
UNUSED
+15V ISO
RC 16
RC 17
PC 6
TRIGGER BOARD
RC16/PLG16
RC17/PLG17
RC18/PLG18
RC19/PLG19
RC21/PLG21
XR ALUMA-PRO GUN/TACH
PLG1
PLG2
PLG3
R5
R4
CW
PB1
BRAN
WHT
GRN
RED
BLK
BROWN
TACH
CHASSIS
40 JOG
35 +15V
41 PURGE
S2
PC2 INTERFACE/ DISPLAY BOARD
RC2/PLG2
RC100
OPTIONAL IO BOARD
PC 5 FIXTURE INTERFACE BOARD
RC3/PLG3
RC14/PLG14
J3/PLG3
J4/PLG4
J5/PLG5
J6/PLG6
PLG 4 REPLACES PLG 3 WHEN INSTALLING FIXTURE BOARD
PLG4
+5V
+0
B
A
+15V
+24V
ARC DETECT NO
ARC DETECT NC
ARC DETECT
FLOW RELAY NO
FLOW RELAY NC
FLOW RELAY
RELAY 2 NO
RELAY 2 NC
RELAY 2
RELAY NO
RELAY NC
RELAY 1
AUX 1 OUT
AUX 1 IN
AUX 2 OUT
AUX 2 IN
AUX TRIG OUT
AUX TRIG IN
GAS OUT
GAS IN
WATER OUT
WATER IN

244 221-D

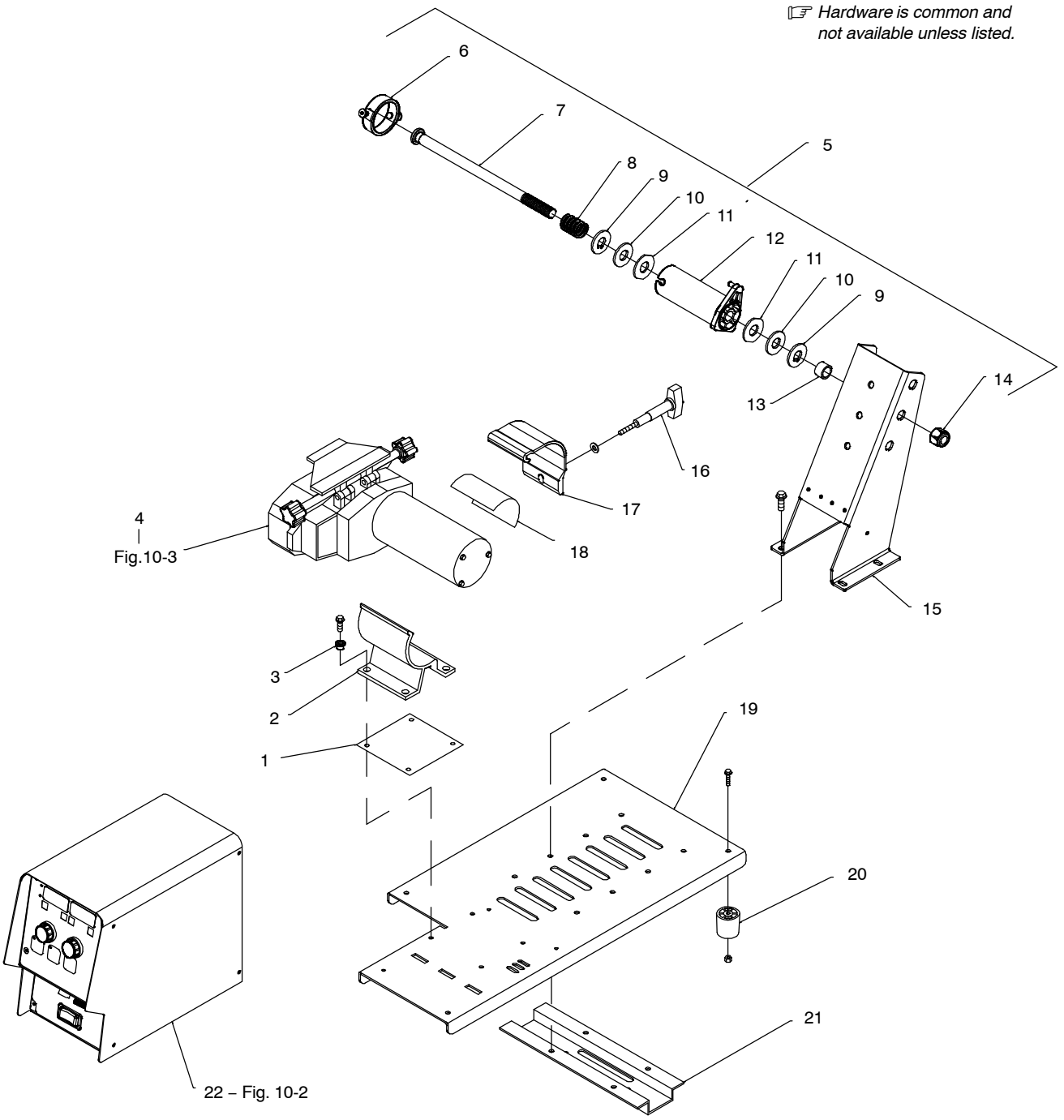


Figure 10-1. Main Assembly

Item No.	Part No.	Description	Quantity

Figure 10-1. Main Assembly

1	159 647	Insulator, Motor Clamp	1
2	159 646	Clamp, Motor Base	1
3	159 360	Insulator, Screw Machine	4
4	244 585	Drive Assy, Wire S/L 4 Roll W/Tach Accu−Mate	1
5	141 753	Hub+Spindle Assy, (Includes)	1
6	058 427	Ring, Retaining Spool	1
7	180 571	Shaft, Support Spool	1
8	010 233	Spring, Cprsn .970 Od X .120 Wire X 1.250Pld	1
9	057 971	Washer, Flat Stl Keyed 1.500Dia X .125Thk	2
10	010 191	Washer, Fbr .656 Id X 1.500 Od X .125Thk	2
11	058 628	Washer, Brake Stl	2
12	058 428	Hub, Spool	1
13	248974	Tubing, Stl .875 x 12 Ga Wall x .562	1
14	135 205	Nut, Stl Slflkg Hex Reg .625-11 W/Nylon Insert	1
15	200 556	Support, Spool	1
16	201 781	Knob, W/Extension Clamp	1
17	156 243	Clamp, Motor Top	1
18	145 639	Strip, Buna−n .062 X 3.000 X 4.000 Compressed Sht	1
19	200 552	Base	1
20	134 306	Foot, Rubber 1.250 Dia X 1.375 High No 10 Screw	4
21	200 557	Stiffener, Base	1
22		Control Box (Refer to Figure 10-2)	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

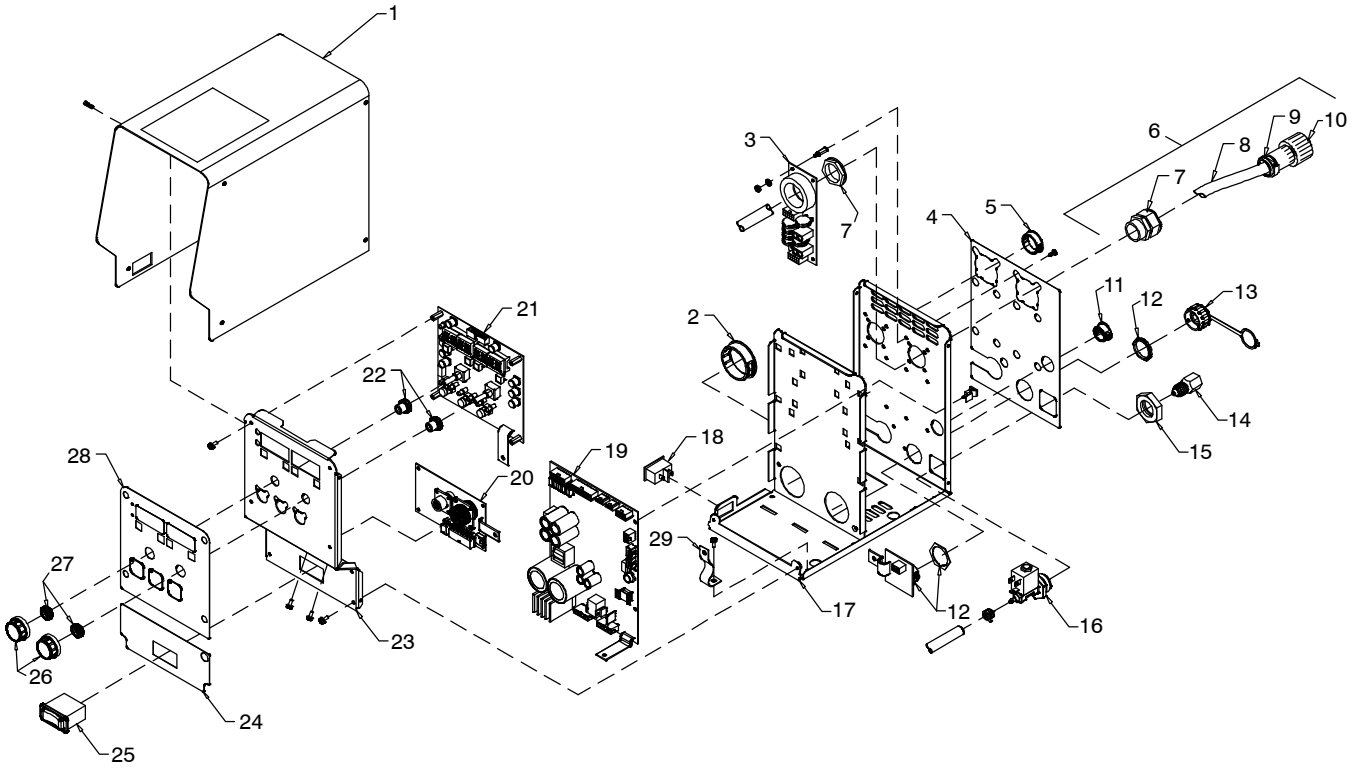


Figure 10-2. Control Box

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 10-2. Control Box (Figure 10-1 Item 21)	
1		235 211	Wrapper, Feeder	1
2		010 494	Bushing, Snap−in Nyl 1.375 Id X 1.750 Mtg Hole	2
3		244 200	Circuit Card Assy, 14 Pin Filter	1
4		244 168	Nameplate, Rear	1
5		241 416	Blank, Snap−in Nyl 1.187 Mtg Hole Black	1
6		244 581	Cable, Power (Includes)	1
7		139 041	Bushing, Strain Relief .450/.709 Id X1.115 Mtg Hole	1
8		163 520	Cable, Port No 18−14 11/C Type Awm 2−14 9−18 Cndct	1
9		079 739	Conn, Circ Cpc Clamp Str Rlf	1
10	PLG12	141 162	Housing Plug+Pins, (Service Kit)	1
	PLG74	115 092	Housing Plug+Skts, (Service Kit)	1
11		000 527	Blank, Snap−in Nyl .875 Mtg Hole Black	1
12		244 191	Circuit Card Assy, USB Filter	1
13		244 618	Cover, Connector USB W/Tether	1
14		211 989	Fitting, W/Screen	1
15		220 805	Nut, 750−14 Nps 1.48Hex .41H Nyl	1
16	GS1	228 036	Valve, 24VAC 1Way .750−14 Thd 2.0mm Orf 100 psi	1
17		246 571	Enclosure, Control/Motor	1
18	S1	111 997	Switch, Rocker Spst 10A 250VAC On-Off Visi Red Rock	1
19	PC1	242 217	Circuit Card Assy, Motor Control W/Prgm	1
20		244 207	Circuit Card Assy, Trigger Filter	1
21		246 145	Circuit Card Assy, User Interface W/Prgm	1
22		231 470	Nut, Adapter Encoder Shaft Mtg 375−32 To 500−28	2
23		244 881	Panel, Front	1
24		243 910	Nameplate, Lower	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 10-2. Control Box (Figure 10-1 Item 21) (Continued)

. . . 25	200 295	. .	Switch, Rocker Spdt 15A 12V (On)−Off−(On)	1
. . . 26	245 663	. .	Knob, Encoder 1.250 Dia X .250 Id Push On W/Spring Clip	2
. . . 27	231 469	. .	Nut, 500−28 .69Hex .28H Brs Conical Knurl	2
. . . 28	243 898	. .	Nameplate, Upper	1
. . . 29	246 559	. .	Strap, Grounding 3.50 In Long	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

	Dia. Mkgs.	Part No.	Description	Quantity

Harness Connectors/Receptacles

. . . . . PLG6,106 . . .	115 094	. .	Housing Plug+Skts, (Service Kit)	1
. . . . . PLG10,110 . .	130 203	. .	Housing Plug+Skts, (Service Kit)	1
. . . . . PLG72	115 092	. .	Housing Plug+Skts, (Service Kit)	1
. . . . . PLG4,104 . . .	136 810	. .	Housing Plug+Skts, (Service Kit)	1
. . . . PLG11, 21,71,111	131 055	. .	Housing Rcpt+Skts, (Service Kit)	1
. . PLG1,77,78,79,101	202 592	. .	Housing Plug+Skts, (Service Kit)	1
. . . . . PLG3,75,76,103	115 093	. .	Housing Plug+Skts, (Service Kit)	1
. . . . . PLG51	174 824	. .	Housing Plug Pins+Skts, (Service Kit)	1
. . . . . PLG7,27,67,107	115 091	. .	Housing Plug+Skts, (Service Kit)	1
. . . . . PLG73	148 439	. .	Housing Plug Pins+Skts, (Service Kit)	1
. . . . . PLG17,70 . . .	158 719	. .	Housing Plug+Skts, (Service Kit)	1
. . . . . PLG117 . . .	165 404	. .	Housing Rcpt+Skts, (Service Kit)	1

☞ *Hardware is common and not available unless listed.*

See Table 10-1 For Drive Roll & Wire Guide Kits

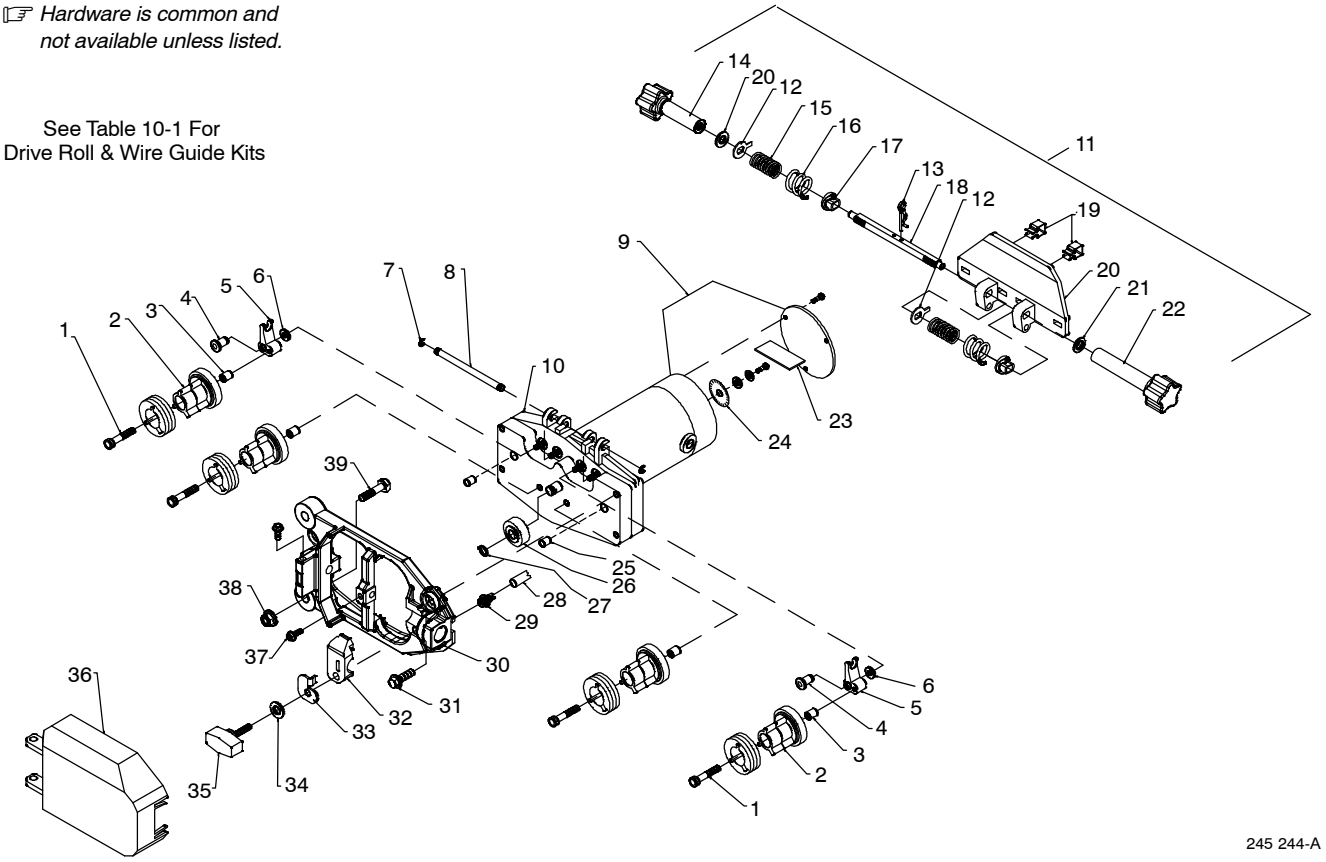


Figure 10-3. Drive Assembly, Wire

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 10-3. Drive Assembly, Wire (Figure 10-1 Item 4)	
1		010 668	Screw, Cap Stl Sch .250-20 X 1.500	4
2		172 075	Carrier, Drive Roll W/Components	4
3		149 962	Spacer, Carrier Drive Roll	4
4		149 486	Pin, Rotation Arm Rocker	2
5		244 584	Arm, Pressure LH Chamfered	2
6		150 520	Spacer, Flat Stl .257 Id X .619 Od X .105	2
7		133 493	Ring, Retaining Ext .250 Shaft X .025Thk	2
8		133 350	Pin, Hinge	1
9	M1,101	201 230	Motor, Gear 1/8HP 24VDC Standard Speed	1
		153 491	Kit, Brush Replacement (Includes)	1
		153 492	Cap, Brush	2
		*153 493	Brush, Carbon	2
		184 136	Kit, Brush Holder Replacement	1
10		155 098	Kit, Cover Motor Gearbox (Includes)	1
		153 550	Cover, Motor Gearbox (Includes)	1
		155 099	Gasket, Cover	1
		155 100	Screw, Cover	5
		154 031	Spacer, Locating	2
		133 493	Ring, Rtng Ext .250 Shaft Grv X .025Thk	1
11		203 642	Pressure Arm, R & Vert L 4 Roll (Includes)	1
11		203 631	Pressure Arm, S/L & Vert S/R 4 Roll (Includes)	1
12		203 641	Washer, Flat Indicator Spring Tension	2
13		182 415	Pin, Cotter Hair	1
14		203 640	Knob, W/Extension Short Pressure Arm	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 10-3. Drive Assembly, Wire (Continued)

. . . 15		182 156	. . . . Spring, Cprsn	2
. . . 16		182 155	. . . . Spring	2
. . . 17		132 746	. . . . Bushing, Spring	2
. . . 18		203 633	. . . . Shaft, Spring	1
. . . 19		246 098	. . . . Clip, Spring Pressure Blocking	2
. . . 20		203 632	. . . . Shaft Carrier	1
. . . 21		133 739	. . . . Washer, Flat Buna .375 Id X .625 Od X .062Thk	2
. . . 22		203 637	. . . . Knob, W/Extension Long Pressure Arm	1
. . . 23 .	PC51,151	. . . 237 048	. . Circuit Card, Digital Tach (Includes)	2
. . . . .	PLG5	. . . . . 131 204	. . . . Connector & Sockets	1
. . . . .		604 311	. . . . Grommet, Rbr .250 Id X .375Mtg Hole .062 Groove	1
. . . 24		132 611	. . Optical Encoder Disc	1
. . . . .		603 115	. . Weather Stripping, Adh .125 X .375	1
. . . 25		167 387	. . Spacer, Locating	2
. . . 26		168 825	. . Drive, Pinion	1
. . . 27		133 308	. . Ring, Retaining Ext .375 Shaft X .025Thk	1
. . . 28		134 834	. . Hose, Sae .187 Id X .410 Od (Order By Ft)	2Ft (0.6 m)
. . . 29		149 959	. . Fitting, Brs Barbed M 3/16tbg X .312-24	1
. . . 30		244 579	. . Adapter, Gun/Feeder LH ACCU−MATE	1
. . . 30		244 589	. . Adapter, Gun/Feeder RH ACCU−MATE	1
. . . 31		108 940	. . Screw, Cap Stl Hexhd .250-20 X .750	4
. . . 32		242 259	. . Clamp, Power Pin	1
. . . 33		242 261	. . Lock, Power Pin	1
. . . 34		231 232	. . Washer, Flat .344 ID X 0.688 OD X .065 T Stl Pld ANSI.312 Clr	1
. . . 35		151 437	. . Knob, Plstc T 1.125 Lg X .312-18 X 1.500	1
. . . 36		179 277	. . Cover, Drive Roll (Includes)	1
. . . . .		196 956	. . . . Label, Warning Electric Shock And Pinch Wordles	1
. . . 37		151 290	. . Screw, Mach Stl Hexwhd 10-32 X .500	2
. . . 38		167 788	. . Nut, 375−16 .56 Hex .34H Stl Pld Sem Cone WSHR.88 D	1
. . . 39		601 966	. . Screw, Cap Stl Hexhd .375-16 X 1.250	1

*Recommended Spare Parts.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Table 10-1. Drive Roll And Wire Guide Kits

	"V" GROOVE FOR HARD WIRE	"U" GROOVE FOR SOFT –SHELLED CORED WIRES	"V" KNURLED FOR HARD –SHELLED CORED WIRES	"U" COGGED FOR EXTREMELY SOFT WIRE OR SOFT – SHELLED CORED WIRES	"U" GROOVE FOR ALUMINUM WIRES CONTAINS NYLON WIRE GUIDES
WIRE SIZE					
.023/.025 in. (0.6 mm)	**151024**				
.030 in. (0.8 mm)	**151025**				
.035 in. (0.9 mm)	**151026**		**151052**		**243233**
.040 in. (1.0 mm)	**161190**				
.045 in. (1.1/1.2 mm)	**151027**	**151037***	**151053**	**151070**	**243234***
.052 in. (1.3/1.4 mm)	**151028**	**151038**	**151054**	**151071**	
1/16 in. (1.6 mm)	**151029**	**151039**	**151055**	**151072**	**243235**
.068/.072 in. (1.8 mm)			**151056**		
5/64 in. (2.0 mm)		**151040**	**151057**	**151073**	
3/32 in. (2.4 mm)		**151041**	**151058**	**151074**	
7/64 in. (2.8 mm)		**151042**	**151059**	**151075**	
1/8 in. (3.2 mm)		**151043****	**151060****	**151076****	
*Accommodates .045 and .047 (3/64 in) wire **Requires a low –speed wire feeder					

Wire Guides			**Nylon Wire Guides for Feeding Aluminum Wire**		
Wire Sizes	Inlet Guide	Intermediate Guide	Wire Size	Inlet Guide	Intermediate Guide
.023 to .040 in. (0.6 to 1.0mm)	221030	149518	.035 in. (0.9mm)	221912	242417
.045 to .052 in. (1.1 to 1.4mm)	221030	149519	.047 in. (1.2mm)	221912	205936
1/16 to 5/64 in. (1.6 to 2mm)	221030	149520	1/16 in. (1.6mm)	221912	205937
3/32 to 7/64 in. (2.4 to 2.8mm)	229919	149521			
1/8 in. (3.2mm)	229919	149522			

Warranty Questions?

Call
1-800-4-A-MILLER
for your local
Miller distributor.

Your distributor also gives you ...

Service
You always get the fast, reliable response you need. Most replacement parts can be in your hands in 24 hours.

Support
Need fast answers to the tough welding questions? Contact your distributor. The expertise of the distributor and Miller is there to help you, every step of the way.

Miller

TRUE BLUE® WARRANTY

Effective January 1, 2011
(Equipment with a serial number preface of MB or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the delivery date of the equipment to the original end-user purchaser, and not to exceed one year after the equipment is shipped to a North American distributor or eighteen months after the equipment is shipped to an International distributor.

1. 5 Years Parts — 3 Years Labor
   * Original main power rectifiers only to include SCRs, diodes, and discrete rectifier modules
2. 3 Years — Parts and Labor
   * Engine Driven Welding Generators **(NOTE: Engines are warranted separately by the engine manufacturer.)**
   * Inverter Power Sources (Unless Otherwise Stated)
   * Plasma Arc Cutting Power Sources
   * Process Controllers
   * Semi-Automatic and Automatic Wire Feeders
   * Smith 30 Series Flowgauge and Flowmeter Regulators (No Labor)
   * Transformer/Rectifier Power Sources
   * Water Coolant Systems (Integrated)
3. 2 Years — Parts
   * Auto-Darkening Helmet Lenses (No Labor)
4. 1 Year — Parts and Labor Unless Specified
   * Automatic Motion Devices
   * CoolBelt and CoolBand Blower Unit (No Labor)
   * External Monitoring Equipment and Sensors
   * Field Options (NOTE: Field options are covered for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
   * Flowgauge and Flowmeter Regulators (No Labor)
   * RFCS Foot Controls (Except RFCS-RJ45)
   * Fume Extractors
   * HF Units
   * ICE Plasma Cutting Torches (No Labor)
   * Induction Heating Power Sources, Coolers, and Electronic Controls/Recorders
   * Load Banks
   * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
   * PAPR Blower Unit (No Labor)
   * Positioners and Controllers
   * Racks
   * Running Gear/Trailers
   * Spot Welders
   * Subarc Wire Drive Assemblies
   * Water Coolant Systems (Non-Integrated)
   * Weldcraft-Branded TIG Torches (No Labor)
   * Wireless Remote Foot/Hand Controls and Receivers
   * Work Stations/Weld Tables (No Labor)
5. 6 Months — Parts
   * Batteries
   * Bernard Guns (No Labor)
   * Tregaskiss Guns (No Labor)
6. 90 Days — Parts
   * Accessory (Kits)
   * Canvas Covers
   * Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
   * M-Guns
   * MIG Guns and Subarc (SAW) Guns
   * Remote Controls and RFCS-RJ45
   * Replacement Parts (No labor)
   * Roughneck Guns
   * Spoolmate Spoolguns

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, relays, work station table tops and welding curtains, or parts that fail due to normal wear. (Exception: brushes and relays are covered on all engine-driven products.)**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

Owner's Record

Please complete and retain with your personal records.

Model Name	Serial/Style Number
Purchase Date	(Date which equipment was delivered to original customer.)
Distributor	
Address	
City	
State	Zip

For Service

Contact a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:	Welding Supplies and Consumables Options and Accessories Personal Safety Equipment Service and Repair Replacement Parts Training (Schools, Videos, Books) Technical Manuals (Servicing Information and Parts) Circuit Diagrams Welding Process Handbooks To locate a Distributor or Service Agency visit www.millerwelds.com or call 1-800-4-A-Miller
Contact the Delivering Carrier to:	File a claim for loss or damage during shipment. For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.

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For International Locations Visit
www.MillerWelds.com

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